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ABSTRACT

This manual is designed as a resource for trainers who provide preservice training, either in-country or state-side, to health specialists and generalists assigned to health projects at the community and clinical levels. The training is intended to assist the volunteer in developing knowledge and skill in the areas of primary health care and the complementary skills, knowledge, and attitudes necessary to work cooperatively with others. This volume contains the final three modules. Each module begins with a set of behavioral objectives and contains a sequence of sessions that address the specific context area. Each session follows this format: total time, overview, objectives, list of resources, a list of required materials, and procedures (a series of steps to follow to meet the objectives) with accompanying trainer notes. Handouts for trainees and trainer attachments (trainer resources) follow most sessions. Module titles (and representative session titles) are nutrition (recognizing malnutrition, breastfeeding and weaning, preventing malnutrition); maternal and child health (pregnancy and prenatal care, high risk pregnancy, well baby care); and diseases in the developing world (recognition of immunizable diseases, transmission of immunizable diseases, disease prevention and control, dehydration assessment, rehydration therapy, treatment and prevention of endemic diseases). A 134-item bibliography is attached. (YLB)

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TRAINING FOR DEVELOPMENT

Technical Health Training Manual

Vol. 2

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TECHNICAL HEALTH TRAINING MANUAL

Volume II

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Module 5

Nutrition

Behavioral Objectives

By the end of this module, participants will be able to:

1. Describe the nutritional content of local foods in terms of "energy foods", "body building foods", and "protective foods" and demonstrate how to combine examples from each group to complement proteins and provide a balanced diet acceptable to the local culture.

2. Prepare one nutritionally sound meal using only locally available foods, utencils, cooking equipment and fuel. The meal will be based on local traditional recipes.

3. Identify nutritionally at-risk infants and children and detect signs and symptoms of malnourishment and specific nutritional deficiencies when shown pictures, slides, or actual children in a clinic.

4. Given a health history of at least one child, demonstrate the ability to use and interpret the Road to Health Growth Chart and anthropometric measurements according to procedures outlined by the trainer.

5. State breastfeeding and food requirements of a 4 month, 6 month, 9 month, and 1 year-old baby according to weaning guidelines presented in Session 30.

6. Prepare at least one multimix weaning food which contains a staple, a legume, and a protein and is made from foods available in the local market.

7. Define causal chain and causal web and list three factors for each in relation to malnutrition.

8. Describe the purpose of the nutrition rehabilitation centers in the host country and give examples of four kinds of health education activities that are carried out in these centers.

Session 28

FOODS AND NUTRITION

TOTAL TIME

1-2 hours for market visit
2 hours for classroom activities
2 hours for preparing traditional meal

OVERVIEW

A very basic and logical place to begin learning about nutrition in the developing world is the relationship among food, diet, and nutritional status. Here, participants visit a market place and purchase available foods, especially the most traditional in the local diet.

Back at the training site they categorize the foods into three food groups, according to their primary nutrient content. Through an examination of the cost, availability, cultural preference and nutritional content of the foods, participants recognize some of the effects of dietary practices on families in the community.

To gain further insight into the traditional diet, and valuable skill in food preparation participants cook and eat a traditional meal at the end of the session.

OBJECTIVES

- To ascertain the local name, cost, availability, nutritional content, and dietary use of foods purchased in the local market.
(Steps 2-4)
- To describe the three main food groups in terms of local foods belonging to each group, the nutrients they offer, and the functions those nutrients serve in the body.
(Steps 4, 5)
- To examine the potential impact of the local diet on the community.
(Steps 6, 7)
- To prepare one nutritionally sound meal using local foods and discuss additional ways of combining available foods to create nutritious, affordable and culturally acceptable meals.
(Step 8)

RESOURCES

- Helping Health Workers Learn, Chapter 25, pp. 39-44.
- Diet for a Small Planet

Handouts:

- 28A Three Food Groups
- 28B Complimentary Vegetable Proteins
- 28C Vocabulary list of local foods and cooking terms (to be developed by the Trainer).
- 28D Recipes for Traditional Meals (to be developed by the Trainer).

MATERIALS

Newsprint and markers; money to distribute to participants for food purchases; flannel board and figures or other visual aid materials for demonstrating how to teach the three food groups (Step 7); cooking area with local equipment, utensils, and fuel for meal preparation.

TRAINER NOTE

While all of the activities in this session are important and practical for future, PCV's, they can be modified to suit different training situations and schedules. For example, the market visit could be scheduled one to two days prior to the classroom activities. The meal preparation can be scheduled for noontime, or the following day.

If possible, coordinate the visit, discussion and meal preparation with language training. Language instructors as well as other host country staff (e.g., cooks and secretaries) can help develop the vocabulary lists and recipes, accompany participants to the market, and provide assistance in the "kitchen".

For Step 6, ask a participant to prepare a short explanation and demonstration of complementary proteins. Diet for a Small Planet, by Francis M. Lappe, is a good reference for this information concept.

In addition to developing Handouts 28C and 28D (see "Resources"), be sure to also adapt the attached handouts so that they focus on local food items.

Continued

To organize the meal preparation, you will need to plan a menu ahead of time based on the traditional recipes and make a list of all foods and other items required. Divide the items on the list among participants and tell the groups to purchase these (among other items) during their market visit.

For additional information and training training ideas on foods and nutrition read Session 4 of the Personal Health Training Manual (Peace Corps).

A final note on this session: If participants are assigned to a health program which includes a heavy focus on nutrition, MCH, food preparation, and/or working with women's groups, then all of the activities proposed here are essential. Volunteers in nutrition-related programs need practice to feel comfortable and capable in the market place and in the kitchen.

Step 1
(10 min)

Introducing the Science of Nutrition

Introduce the session with some brief remarks around the following points:

- Nutrition is the science of food and how your body uses it.
- Food is made up of certain chemical substances that work together and interact with body chemicals to serve the needs of the body. (Ask participants to name the six classes of nutrients - proteins, carbohydrates, fats, vitamins, minerals, water - and list these on newsprint.)
- The nutrients needed by healthy individuals are usually available in foods though no natural food, by itself, has all the nutrients needed for adequate growth and good health.
- Food is culturally defined and selection is usually influenced by social and cultural factors (for example, insects and dogs are considered food sources in many countries, but not in the U.S.).
- During this session we are going to look at some basic nutrition concepts and how we can make the most of locally available foods to ensure proper nutrition.

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Step 2
(10 min)

Assigning Tasks for the Market Visit

Explain to participants that they will visit the local market for the next one to two hours during which time they will talk to the vendors, examine the various categories and kinds of available foods, and purchase several food items to bring back to the training site.

Ask participants to divide into pairs or triads for the visit. If local language capability is required, divide the group so that a participant with strong language skills is in each triad or ask host country staff members (e.g. language instructors) to accompany the group during the visit.

Give participants money for purchasing their food items and assign each triad one to three specific traditional foods to purchase for cooking later in the session. Explain that they should find and buy these commonly used foods as well as other foods they see during the foray. (Refer to Trainer Note at the beginning of the session). For each food item purchased they should:

- learn and record the local name.
- record the cost, availability, and how it is sold (by weight, volume, etc.).
- try to ascertain how and when it is prepared and used in the local diet.

Ask participants if they have any questions or other points they would like to add to the task assignment. Tell the group when they should be back at the training site.

TRAINER NOTE

If host country staff go with the groups to the market, explain to them beforehand that the participants should do as much of the talking and purchasing as possible. The staff member serves only as a resource not a guide.

Step 3
(1-2 hours)

The Market Visit

Have participants visit the market and complete the task.

As each triad returns, ask them to sit together and be prepared to present their purchases to the large group.

Step 4
(30 min)

Identifying and Categorizing Local Foods

When all the participants are reconvened, ask a spokesperson from each group to take 4 minutes to share impressions of the marketplace and summarize the experience and interacting with the people who work there.

Afterwards, explain to the group that they are going to take the foods they purchased in the market and categorize them into three groups. Point out the three sheets of newsprint (see Trainer Note below), each one labeled with the name of a food group. Demonstrate which foods belong in which group by selecting from the assortment one or two examples of an energy food, a body-building food, and a protective food.

Explain to the group that as each triad reports on their purchases they should place each of their foods on the newsprint in the appropriate group. For their reports, ask participants to give the following information.

- the local name of the food.
- the cost, availability and how it's sold.
- what it's used for, how it's cooked, and any other relevant data.

As the group presents their foods, write the English name and local name on the board and ask participants to write down the information in their notebooks for future reference. Also ask the participants if any of the foods appear misplaced and if so, to say why and move it to the appropriate group.

TRAINER NOTE

For Steps 4 and 5, you should select the system of food categorization used in the host country and/or recommended by the Ministry of Health. Be sure you know how local foods are categorized within it. Handout 28A suggests the categories of "energy foods", "body-building foods", and "protective foods", but other categorizations, which for example, separate the staple from the other energy foods are also acceptable. Do not use schemes with more than four food groups as these get confusing. Whichever system you choose, be certain it is based in nutritional science.

Before the participants return from their market visit, label three sheets of newsprint with the names of the three food groups. Spread these out on the floor and arrange the participants chairs in a circle around them.

Step 5
(15 min)

Analyzing the Three Food Groups

Ask participants to look over the three groups of food in the middle of the room and consider any experience they've had eating the traditional diet. Conduct a discussion around the following questions:

- What do each of the food groups do for the body?
- What is meant by a "balanced diet" both in terms of type and quantity of food?
- What foods in each of the areas on the floor are more nutritious than others in their same group? How can you tell?
- Is each group well represented in the local diet? (If some type of food was purchased by nearly everyone, discuss why this was so. If some type of food is notably missing from their purchases, discuss why this might be so.)
- What conclusions can be drawn from seasonality and cost of foods as they relate to the three food groups and nutritional status?

Trainer Note

If any type of foods happen to be wilting, or beginning to spoil, discuss the problems with storage that people may have due to lack of refrigeration, market facilities, food transport and distribution, etc.

BREAK 10 MINUTES

Step 6
(20 min)

Demonstrating Traditional Meals and Complementary Proteins

Based on their experience eating traditional meals during their stay in the country ask several members of the group to demonstrate how some of the foods in the room are combined to form traditional meals. If possible, have a host country staff member present to comment on the participants combinations, show other traditional meals, and demonstrate a typical daily diet.

Have the group analyze the meals for:

- variety (all three food groups)
- adequate mixture of food groups (all three groups represented in sufficiently nutritious amounts).

Ask the pre-selected participant to give the short lecturette on complementary proteins using the same traditional foods to illustrate the concept and show examples of how the culture either already uses complementary combinations or could make some adjustments to enhance the nutrient value of the meal.

Distribute Handout 28A (Three Main Food Groups), Handout 28B (Complementary Vegetable Proteins), and Handout 28C (Vocabulary List of Local Foods and Cooking Terms) as reference material for participants.

TRAINER NOTE

Most diets in the developing world are based on complementary proteins, often times grain-legume combinations. Be sure the group understands how this theory may already be practiced in the host culture.

During discussion make the point that grain-legume combinations are usually significantly cheaper sources of protein than meats, poultry, and animal products. Demonstrate to the group how to combine grains and legumes in sufficient proportions to get the optimal protein.

Step 7
(25 min)

Relating the Traditional Diet and Nutrition

After the demonstrations and discussion on traditional food combinations and complementary proteins, help the group draw some conclusions and apply what they have learned about the relationship between the local diet and the nutritional status of the community. Ask participants to address these questions:

- Why do you think these food items constitute the traditional meal? Is it because of their availability, cost or habit?
- What are your general impressions about the local diet? What might be some positive and negative aspects of the diet?
- From what you have learned about the nutritive value of the traditional meal, what could make it more nutritious using foods that are available and affordable. How could you find out if these suggestions are culturally acceptable.
- How often will you prepare a meal of this sort? Why? Why not?
- What are some possible health education messages for the local community regarding balanced diets and nutrient-rich foods?

Trainer Note

If time allows, briefly demonstrate the use of a flannelboard (or other visual aides) for teaching about food groups and balanced meals to mothers and children. See Chapter 25, pages 39-44, of Helping Health Workers Learn for ideas.

Step 8
(2 hours)

Preparing a Traditional Meal

End the session by having the group prepare and eat a meal using the foods they purchased in the market. Distribute Handout 28D (Recipes for Traditional Meals) and ask participants to decide which of the dishes they want to try. Have them make their selections, divide into small work groups and begin the food preparation.

As the activity procedes, ask participants to circulate around the cooking area to observe the other dishes being prepared. When appropriate, call the group together to demonstrate or explain aspects of cooking and food processing which may be new and foreign to the group.

When the dishes are ready to eat, call in any invited guests and ask someone in the group to demonstrate local serving and eating protocal and procedures. During the meal ask participants to informally describe their dishes to interested guests. At the end, have the group clean-up the cooking area.

TRAINER NOTE

This type of activity not only provides a pleasant change of pace in the training program, it also enable participants to acquire skills which will later help them gain credibility with the women in their communities.

Ideally, the cooking site and entire cooking process should simulate the local way of doing things. Activities would include using only available utensils, and containers, peeling, cutting and chopping using local methods, preparing and managing a fire, testing for taste and doneness as local women would do.

If the group makes several different kinds of dishes, discuss each one in terms of 1) when it is usually eaten during the day or week, 2) if it is eaten alone or with some other food, and 3) its relative cost. Be sure the group understands which food(s) comprise the everyday traditional diet of the poorer members of the community.

Ask host country staff members to assist you as "resource cooks" during the preparation. Above all, try to keep the climate relaxed and fun.

If possible, invite other trainees, training staff, Peace Corp staff and/or local agency representatives to be guests at the meal.

THREE MAIN FOOD GROUPS

Group I: Body Building (Protein) Foods

This group contains foods which provide a high percentage of protein, important in building ,maintaining, and repairing body tissue. Although there are different types of proteins, all are made up of small molecules called amino acids. It is these individual amino acids which are required by the body. This group includes: beef, lamb, chicken, fish, eggs, milk, cheese, peanuts, soybeans, black eyed and other beans, peas, legumes, crabs, snail, and shrimp.

Group II: Energy (Carbohydrate) Foods

This group provides calories to the body through the consumption of foods which contain either high amounts of carbohydrates and/or fats. Carbohydrates make up the chief source of energy for the body, and are the least expensive form of energy-providing food. Fats are important because of their high energy potential and their role in absorbing certain vitamins. Fats also help to make foods tastier and provide a feeling of fullness. Some of the common food items found in this group are: bread, plaintain, corn, rice, sorghum, millet, cassava, yams, butter, coconut, palm oil, sesame seed oil, peanut oil.

Group III: Protective (Vitamin/Mineral) Foods

These foods, while not being very high in proteins, carbohydrates or fats, do provide important quantities of vitamins and minerals needed to protect the body against malfunctioning and to help ensure proper metabolism. Vitamins and minerals (such as calcium, phosphorous) are important elements in maintaining resistance against illness. Since vitamins are often lost during cooking care should be taken to not overcook vegetables. Protective foods consist mainly of fruits and vegetables, including: mango, orange, papaya, tomato, onion, sweet peppers, carrot, eggplant, grapefruit, cabbage, avocado, pineapple, cucumber, okra, spinach and other green leafy vegetables.

Session 28, Handout 28B

COMPLEMENTARY VEGETABLE PROTEINS

Proteins come in many forms; some more useable by the body than others. Animal products, such as meat, eggs and milk provide exactly the components we need in the right amounts. Cereals, legumes, seeds and nuts are vegetable proteins and when appropriately combined, offer the same proportion of needed components. Therefore mixing specific vegetable proteins is necessary to obtain adequate levels of protein. The following mixtures of proteins are complementary; meaning that combined, they provide an adequate measure of protein.*

1. GRAINS + LEGUMES
2. GRAINS + ANIMAL PRODUCTS
3. SEEDS AND LEGUMES

*It should be noted that these combinations must be consumed together in the same meal to ensure adequate protein intake.

GRAINS

Examples:

millet
rice
corn
wheat
semolina

ANIMAL PRODUCTS

Examples:

fish
eggs
milk
chicken
beef
lamb
pork
cheese

SEEDS

Examples:

sesame seed
sunflower seed

LEGUMES

Examples:

groundnut
chick pea
lentils
cow pea
black bean
kidney beans
soybeans

Dark green leaves are another source of vegetable proteins and their use should be encouraged.

(Adapted from: Lappe', Diet for a Small Planet)

Session 29

RECOGNIZING MALNUTRITON

TOTAL TIME 4 hours

OVERVIEW

Malnutrition can be defined as that state of nutrition of the body caused by a diet that is either inadequate, imbalanced or is not effectively utilized by the body. Many diseases and deaths which appear to be from infections are actually preconditioned by malnutrition. To prevent severe malnutrition, early recognition of the symptoms of its mild forms and "at risk" children is important.

In this session, participants use pictures or slides to identify "symptoms" of malnutrition as well as the social indicators of "at risk" children.

Later the group discusses growth measurement as a way of assessing children's nutritional status. Participants practice weighing and measuring children and using and interpreting growth charts.

OBJECTIVES

- To recognize the signs and symptoms of malnourished and nutritionally deficient children.
  (Step 1)
- To use and interpret the Road to Health Chart.
  (Steps 4, 5)
- To use and interpret anthropometric measures for identification of "at risk" children.
  (Steps 6, 7)

RESOURCES

- Pediatric Priorities in the Developing World (Chapter 9).
- Nutrition for Developing Countries (Chapter 2)

Handouts:
- 29A How do you Measure Malnutrition?
- 29B Road to Health Chart
- 29C Making and Interpreting a Growth Chart (to be developed by trainer)
- 29D Anthropometric Measures Recording Sheet

Trainers Attachments:
- 29A Kwashiorkor
- 29B Marasmus
- 29C Dectecting Anemia and Vitamin A Deficiency
- 29D Comparison of Anthropometric Measures
- 29E Guidelines for Interpreting Nutrition Surveillance Data
- 29F Examples of Information to be Recorded on a Growth Chart

MATERIALS Slides or pictures of malnourished children, slide projector, newprint, markers.

PROCEDURE

Trainer Note

Before the session make a point of reviewing all the Trainer Attachments, particularly for the preparation of the presentation in Step 1. Also, learn as much as possible about the prevalent nutritional deficiencies in your country and be prepared to discuss them thoroughly in this first step. Make sure the slide show or visual aids you have prepared for Step 1 allows participants the opportunity to see and identify specific signs and symptoms of various kinds and stages of malnutrition and nutritional deficiencies that are common in your country.

Step 1
(30 min)

Recognizing Malnutrition

Using pictures or slides, ask the participants to identify and discuss the clinical signs of the various forms of malnutrition and name them if they can.

Conclude this step by stating that while the group has just reviewed pictures that represent various signs of severe malnutrition, the primary focus of the session is to provide participants with the necessary skills and knowledge to identify children at risk of developing severe forms of malnutrition.

Trainer Note

Four of the most prevelant forms of malnutrition and nutritional deficiencies of which you should obtain slides or pictures of are Kwashiorkor, Maramus, Anemia and Vitamin A deficiency.

Trainer Attachments 29A-C have been provided for your reference and as aids during the participants' discussion of these slides.

You may want to distribute these attachments as handouts for the participants reference when they are in their communities.

During the discussion, make sure participants understand that when assessing a child for signs of malnutrition, it is best to start from the head and work downward.

Step 2
(15 min)

Identifying High Risk Children

Introduce this step by stating that the main causes of malnutrition can be found by examining the social, economic and health statuses of high-risk groups. High-risk groups are usually children between the ages of six months and three years, and women who are pregnant or lactating.

Ask the participants to brainstorm a list of social and physical signs that they could use to identify children at high risk. Tell them that recognizing these factors will help in the development of plans for preventing malnutrtion. If participants have as a training text Guidelines for Training Community Health Workers in Nutrition, have them look over the descriptions of risk factors listed on pages 86 and 87. Ask the group to identify which of the risk factors from their list may be most significant in their communities.

Trainer Note

The following indicators which can be used to identify "at risk" children should be mentioned and recorded on newsprint:

- Maternal weight below 43.5 kg.
- All birth orders over seven
- Breakdown of marriage or death of either parent
- More than four sibling deaths
- Birth weights below 2.4 kg. for males and 2.3 kg. for females.
- Failure to gain 0.5 kg. a month in the first three months of life and 0.25 kg. in the second three months of life.
- Breast infections and difficulties in breast feeding.
- An episode of measles, whooping cough and severe repeated diarrhea in the early months of life.

For specific details concerning these factors, please refer to See How They Grow (Chapter 9) or Pediatric Priorities in the Developing World (Chapter 9). If diarrheal diseases are prevelant in the local communities, be sure to conduct Sessions 39 and 40 with the group. These sessions deal with diarrheal disease control and Oral Rehydration Therapy. Module 7 of Guidelines for Training Community Health Workers in Nutrition discusses in simple terms the relationship between diarrhea and dehydration. You may want to have participants read it as supplementary information.

Step 3
(35 min)

Assessing Nutritional Status

Distribute Handout 29A (How do you Measure Malnutrition?). Go through the handout with the group and elaborate on the measures discussed there. Use Trainer Attachment 29D (Comparison of Anthropometric Measures) to discuss some of the limits of and distinctions between the measures and to cite the advantages and disadvantages of having a few discrete measures with which to assess a child's nutritional status.

During this discussion, show and demonstrate the different measuring devices and techniques by measuring several of the participants. Preferably measure persons of different ethnic groups and sexes to show the variation in measurements and have the group interpret the results according to indices given. Use Trainer Attachment 29E (Guidelines for Interpreting Nutritional Surveillance Data) to explain how to interpret the measures.

Trainer Note

When discussing age for weight, briefly mention various ways that the health worker can determine a child's age. Several methods that can be used are:

- birth certificates
- developing a local events calendar
- counting the number of teeth the child has, and
- noting other developmental characteristics to estimate age.

Step 4
(20 min)

Introducing the Growth Chart

Distribute a blank copy of Handout 29B (Road to Health Chart) to all the participants. As you are passing out this chart tell the participants that measuring a childs growth is one way of measuring his or her health and the quality of his or her nutrition. As growth or health status is not static, this therefore implies that weighing and measuring needs to be a continual process and systematically recorded in order to permit the health worker or parent to understand the child's health status and to detect early signs of growth failure and hence high mortality risk.

Explain the chart to the participants by stating:

- The upper line on the chart shows the weight of well-fed children.
- The lower line indicates the area below which a child weighs less than they should for their age.
- The space between the line is the road to health and life.
- A child's growth curve should always be rising, if it isn't, this indicates that the child is in danger no matter where the child is on the chart.
- A child's age in months is written up the side of the chart.

Next, ask the participants to review the chart and to list the different purposes that it serves. Ask for a volunteer to write their statements on newsprint.

Trainer Note

Several purposes the chart serves include:

- keeping pertinent and concise medical records on children during critical development stages
- encouraging mothers' ongoing involvement with an Under-Fives' clinic or CHW
- providing a quick visual means of monitoring a child's medical history for untrained workers
- charting a child's age and appropriate times for immunizations
- having a record of the health history for different health personnel if the child moves

The Growth Chart that participants work with here should be the one that is used by the Host Country health system.

Step 5 (40 min) Using Growth Charts to Interpret Children's Health Status

Have the participants form several small working groups and distribute Handout 29C (Making and Interpreting a Growth Chart) to each group. Ask them to spend the next 10 minutes filling in and interpreting the information that is attached to each chart and preparing a brief summary of their findings.

After 20 minutes reconvene the groups and have them present their assessment of the child's health and any nutritional recommendations they would give to the mother.

After each small group has finished with their presentation have the other participants evaluate the assessment and state whether they agree or disagree with the diagnosis and why.

After the presentations, ask the group to discuss any difficulties they had in using the chart and to identify the benefits and drawbacks to using it as an assessment tool. Be sure the group understands the relationship between growth and nutrition.

Trainer Note

Use Trainer Attachment 29F as a guide for assembling information that the participants should record on the chart.

Some of the points that should be mentioned or discussed concerning the use and importance of the Road to Health chart are:

- Difficulty getting correct age from mother
- Difficulty in accurately charting the weights
  (e.g. individuals may use January-December calendar rather than the child's birth calendar)
- Individuals become so involved in the actual charting that they forget to analyze the data or discuss the child's progress with the mother.
- Host Country Nationals feel that standards used in developing the growth lines are not appropriate for their population
- If a child is growing well he or she is probably healthy and adequately nourished. Months before a child has obvious signs of malnutrition, he or she will have stopped growing
- Growth is measured in several ways and baby weight is the simplest.

20 Minute Break

Step 6
(60 min)

Assessing and Interpreting Nutritional Status

Have the participants form small groups of two or three persons each and distribute Handout 29D (Anthropometric Measures Recording Sheet). Before the small groups begin measuring children, go over the handout with them and stress the importance of having each person record their measurement immediately after measuring as it is easy to forget and may be tempting to change if it doesn't agree with other group members' measurement results. Tell them there will be a chance to discuss measuring variation and inter-rater reliability in Step 7.

Assign specific groups to the areas where the weighing scales or balances, measuring boards or height measures and arm circumferences tapes or bracelets are located. Have groups take turns weighing children (or each other), measuring their height/length, measuring their arm circumference and talking with them and their parents to establish their ages and general health history.

As facilitator be sure that things are going smoothly and help any participants who are having difficulties. (You may wish to have some national training staff on hand to help with this step also if there are a large number of children who will be present.)

When groups have finished measuring and recording, have them spend a few minutes going over their individual measurements for the various children and filling in Handout 29D (Anthropometric Measures Recording Sheet) with each other. Thank the community members again for their help in the training program.

Trainer Note

This step will vary slightly depending on whether the trainer was able to arrange for local infants and children to come in to be measured or (preferably) for Trainees to visit an Under-Fives Clinic. If children are coming in, the trainer should explain to the group that this is a real opportunity to do some nutrition counseling and to apply health education information they have already learned. When the families arrive, the trainer should welcome them and thank them for helping the training effort. Explain the purpose of the measuring tasks and what procedures will follow. Try not to have any infant or child deluged by participants or measured by more than two small groups using the same techniques. With permission of the parents? You may wish to have participants assess children for other clinical signs and symptoms, (e.g. vitamin A deficiency, anemia, etc.)

If children will not be measured in this step, have participants measure each other or dolls of varying sizes, but be sure to emphasize the great differences between measuring a doll and a 18 month old child who is frightened and squirming.

If time permits you may also wish to have participants consider the accuracy of different local weighing and measuring tools and how they might construct some of the measuring devices themselves in their sites.

Step 7
(20 min)

Group Discussion on Measuring Children

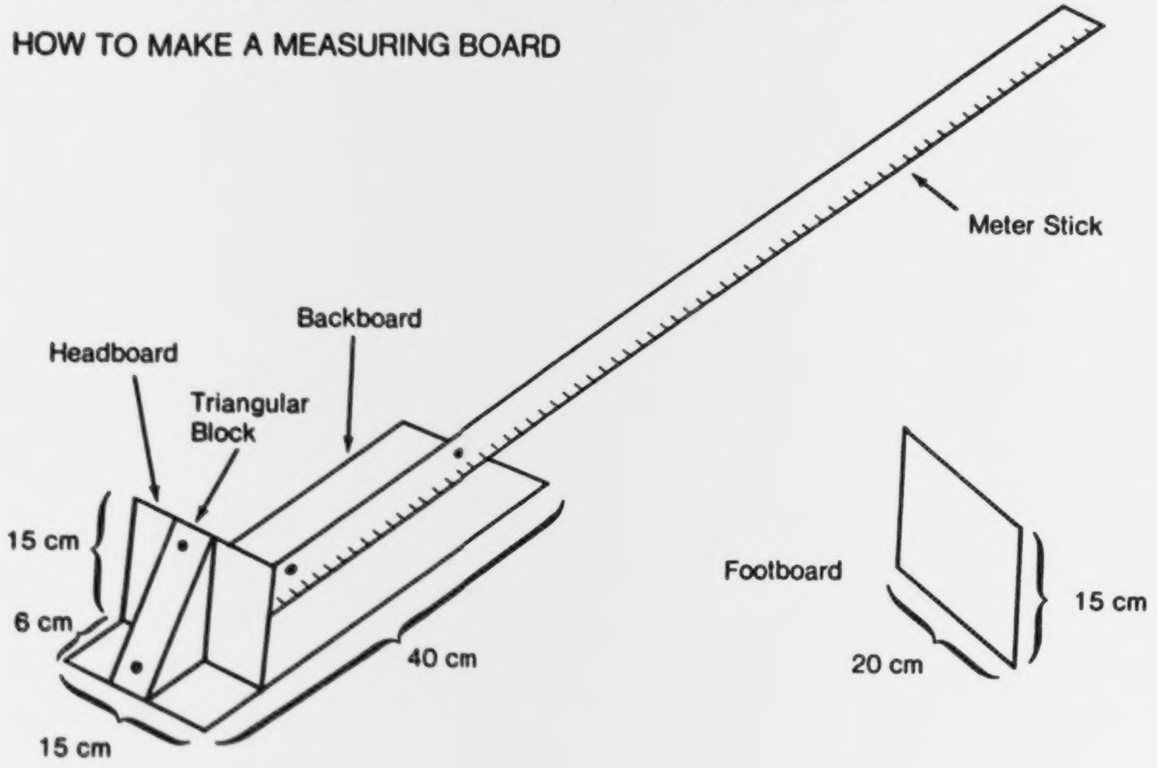
Reconvene the group and have each small group report on their measurements for the various children they measured. Have a participant record these on newsprint and compare the variations in measurements *within* the small groups with the variations *among* the small groups. Have the groups discuss any difficulties they may have had in doing the anthropometry. Have them also discuss any similarities or differences in information gained about the children and in their perceptions of the children and families. They should also briefly discuss the problems encountered and identify any additional information or skills they need.

End the session by asking each participant a skill or attitude needed for conducting good nutritional assessments.

HOW DO YOU MEASURE MALNUTRITION?

How To Measure Weight-For-Length

HOW TO MAKE A MEASURING BOARD


Meter Stick
Backboard
Headboard
Triangular Block
15 cm
6 cm
40 cm
15 cm
Footboard
15 cm
20 cm

Make a measuring board

You can make a measuring board like this:

1. Buy a meter-long measuring stick at a bookstore or hardware store.

2. Get a piece of plywood ½ cm to 1 cm thick. Cut it in 3 pieces:

—15 cm x 15 cm (Headboard)
—15 cm x 40 cm (Backboard)
—15 cm x 20 cm (Footboard)

3. From another piece of wood, about 5 cm thick, cut a triangular block 15 cm x 6 cm.

4. Attach the meter stick, backboard, triangular block, and headboard as shown in the drawing. Use small screws. (The footboard stays separate and is not attached to the other pieces.)

5. Since the backboard will be rough (because of the meter stick and the screws), you can cover the backboard with a cloth, to make the children comfortable.

Measure the child

Measure any child who fits on the measuring board, no matter how old he is. Put the measuring board on the ground. Lay the child on it with his back on the backboard, and his head against the headboard. Ask your helper to hold the child's head and keep his body straight. Use one hand to press on the child's knees and make his legs straight. Use your other hand to push the footboard against his feet until it touches his heels. Hold the footboard in place while your helper lifts the child off the board. Read the child's length on the meter stick and write it on your list.

Weigh the child

A small scale is best, so you can carry it with you and weigh each child at home. You can order a small hanging scale from this address:

CMS Weighing Equipment Ltd.
18 Camden High Street
London NW1 OJH
England

If you must use a large scale that is too big to carry, leave your scale and measuring board at one house. After visiting each family, take the children to that house to measure and weigh them.

Which children are MALNOURISHED?

For each child, you must know his weight and also the weight he should have for his length. If he weighs too little for his length, he is MALNOURISHED. Look at the "Weight-for-Length List" on the next page.

WEIGHT FOR LENGTH (Supine) FOR BOTH BOYS AND GIRLS

		Percents of Median			
Length	Median	85%	80%	75%	70%
49.0cm	3.2kg	2.7kg	2.6kg	2.4kg	2.3kg
49.5	3.3	2.8	2.6	2.5	2.3
50.0	3.4	2.9	2.7	2.5	2.4
50.5	3.4	2.9	2.7	2.6	2.4
51.0	3.5	3.0	2.8	2.6	2.5
51.5	3.6	3.1	2.9	2.7	2.5
52.0	3.7	3.1	3.0	2.8	2.6
52.5	3.8	3.2	3.0	2.8	2.6
53.0	3.9	3.3	3.1	2.9	2.7
53.5	4.0	3.4	3.2	3.0	2.8
54.0	4.1	3.5	3.3	3.1	2.9
54.5	4.2	3.6	3.4	3.2	2.9
55.0	4.3	3.7	3.5	3.2	3.0
55.5	4.4	3.8	3.5	3.3	3.1
56.0	4.6	3.9	3.6	3.4	3.2
56.5	4.7	4.0	3.7	3.5	3.3
57.0	4.8	4.1	3.8	3.6	3.4
57.5	4.9	4.2	3.9	3.7	3.4
58.0	5.1	4.3	4.0	3.8	3.5
58.5	5.2	4.4	4.2	3.9	3.6
59.0	5.3	4.5	4.3	4.0	3.7
59.5	5.5	4.6	4.4	4.1	3.8
60.0	5.6	4.8	4.5	4.2	3.9
60.5	5.7	4.9	4.6	4.3	4.0
61.0	5.9	5.0	4.7	4.4	4.1
61.5	6.0	5.1	4.8	4.5	4.2
62.0	6.2	5.2	4.9	4.6	4.3
62.5	6.3	5.4	5.0	4.7	4.4
63.0	6.5	5.5	5.2	4.8	4.5
63.5	6.6	5.6	5.3	5.0	4.6
64.0	6.7	5.7	5.4	5.1	4.7
64.5	6.9	5.9	5.5	5.2	4.8
65.0	7.0	6.0	5.6	5.3	4.9
65.5	7.2	6.1	5.7	5.4	5.0
66.0	7.3	6.2	5.9	5.5	5.1
66.5	7.5	6.4	6.0	5.6	5.2
67.0cm	7.6kg	6.5kg	6.1kg	5.7kg	5.3kg
67.5	7.8	6.6	6.2	5.8	5.4
68.0	7.9	6.7	6.3	5.9	5.5
68.5	8.0	6.8	6.4	6.0	5.6
69.0	8.2	7.0	6.6	6.1	5.7
69.5	8.3	7.1	6.7	6.2	5.8
70.0	8.5	7.2	6.8	6.3	5.9
70.5	8.6	7.3	6.9	6.4	6.0
71.0	8.7	7.4	7.0	6.5	6.1
71.5	8.9	7.5	7.1	6.6	6.2
72.0	9.0	7.6	7.2	6.7	6.3
72.5	9.1	7.7	7.3	6.8	6.4
73.0	9.2	7.9	7.4	6.9	6.5
73.5	9.4	8.0	7.5	7.0	6.5
74.0	9.5	8.1	7.6	7.1	6.6
74.5	9.6	8.2	7.7	7.2	6.7
75.0	9.7	8.2	7.8	7.3	6.8
75.5	9.8	8.3	7.9	7.4	6.9
76.0	9.9	8.4	7.9	7.4	6.9
76.5	10.0	8.5	8.0	7.5	7.0
77.0	10.1	8.6	8.1	7.6	7.1
77.5	10.2	8.7	8.2	7.7	7.2
78.0	10.4	8.8	8.3	7.8	7.2
78.5	10.5	8.9	8.4	7.8	7.3
79.0	10.6	9.0	8.4	7.9	7.4
79.5	10.7	9.1	8.5	8.0	7.5
80.0	10.8	9.1	8.6	8.1	7.5
80.5	10.9	9.2	8.7	8.1	7.6
81.0	11.0	9.3	8.8	8.2	7.7
81.5	11.1	9.4	8.8	8.3	7.7
82.0	11.2	9.5	8.9	8.4	7.8
82.5	11.3	9.6	9.0	8.4	7.9
83.0	11.4	9.6	9.1	8.5	7.9
83.5	11.5	9.7	9.2	8.6	8.0
84.0	11.5	9.8	9.2	8.7	8.1
84.5	11.6	9.9	9.3	8.7	8.2

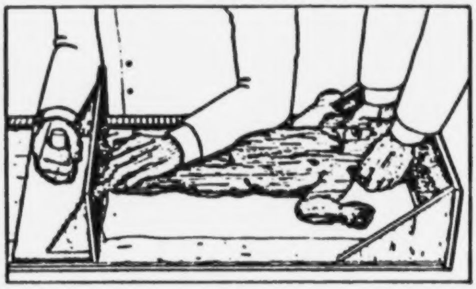
DIRECTIONS FOR MEASURING CHILDREN WHO ARE LESS THAN 85 CM IN LENGTH

Step 1. The measuring board is placed horizontally on the ground or on a table.

Step 2. With the help of one or two assistants, place the baby, barefoot and without head covering on the measuring board with the head against the fixed (nonmovable) end.

Step 3. An assistant holds the baby's head so that the eyes are pointed straight up and applies gentle traction to bring the top of the child's head into contact with the fixed end of the measuring board.

Step 4. The measurer holds the child's knees together and pushes them down against the tabletop with one hand or forearm, *fully extending the child.* With the other hand, the measurer slides the movable footboard to the child's feet until the *heels* of both feet touch the footboard.



Step 5. The measurer then immediately removes the child's feet from contact with the footboard with one hand (to prevent the child from kicking and moving the footboard) while holding the footboard securely in place with the other hand.

Step 6. The measurer reads the measurement to the nearest 0.5 cm.

Step 7. The recorder then writes the measurement clearly on the form.

Step 8. The measurer then looks at the recorded value on the form to be sure that it is correct.

NCHS/CDC/WHO NORMALIZED REFERENCE

Prepared By
HHS, PHS, CDC, CHPE, Nutrition Division,
Atlanta, Georgia 30333

WEIGHT FOR HEIGHT (Stature) FOR BOTH BOYS AND GIRLS

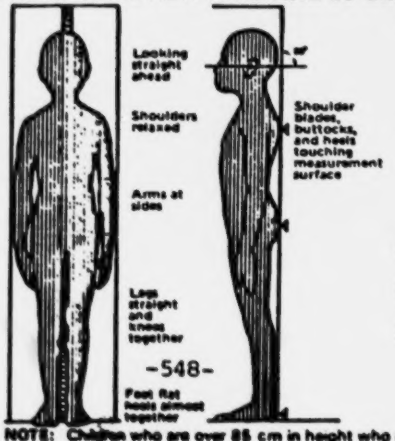
		Percents of Median			
Height	Median	85%	80%	75%	70%
85.0cm	12.0kg	10.2kg	9.6kg	9.0kg	8.4kg
85.5	12.1	10.3	9.7	9.1	8.5
86.0	12.2	10.4	9.8	9.1	8.5
86.5	12.3	10.5	9.8	9.2	8.6
87.0	12.4	10.6	9.9	9.3	8.7
87.5	12.5	10.6	10.0	9.4	8.8
88.0	12.6	10.7	10.1	9.5	8.8
88.5	12.8	10.8	10.2	9.6	8.9
89.0	12.9	10.9	10.3	9.7	9.0
89.5	13.0	11.0	10.4	9.7	9.1
90.0	13.1	11.1	10.5	9.8	9.2
90.5	13.2	11.2	10.6	9.9	9.2
91.0	13.3	11.3	10.7	10.0	9.3
91.5	13.4	11.4	10.8	10.1	9.4
92.0	13.6	11.5	10.8	10.2	9.5
92.5	13.7	11.6	10.9	10.3	9.6
93.0	13.8	11.7	11.0	10.3	9.7
93.5	13.9	11.8	11.1	10.4	9.7
94.0	14.0	11.9	11.2	10.5	9.8
94.5	14.2	12.0	11.3	10.6	9.9
95.0	14.3	12.1	11.4	10.7	10.0
95.5	14.4	12.2	11.5	10.8	10.1
96.0	14.5	12.4	11.6	10.9	10.2
96.5	14.7	12.5	11.7	11.0	10.3
97.0	14.8	12.6	11.8	11.1	10.3
97.5	14.9	12.7	11.9	11.2	10.4
98.0	15.0	12.8	12.0	11.3	10.5
98.5	15.2	12.9	12.1	11.4	10.6
99.0	15.3	13.0	12.2	11.5	10.7
99.5	15.4	13.1	12.3	11.6	10.8
100.0	15.6	13.2	12.4	11.7	10.9
100.5	15.7	13.3	12.6	11.8	11.0
101.0	15.8	13.5	12.7	11.9	11.1
101.5	16.0	13.6	12.8	12.0	11.2
102.0	16.1	13.7	12.9	12.1	11.3
102.5	16.2	13.8	13.0	12.2	11.4
103.0	16.4	13.9	13.1	12.3	11.5
103.5	16.5	14.0	13.2	12.4	11.6
104.0	16.7	14.2	13.3	12.5	11.7
104.5	16.8	14.3	13.4	12.6	11.8
105.0	16.9	14.4	13.6	12.7	11.9
105.5	17.1	14.5	13.7	12.8	12.0
106.0	17.2	14.6	13.8	12.9	12.1
106.5	17.4	14.8	13.9	13.0	12.2
107.0	17.5	14.9	14.0	13.1	12.3
107.5cm	17.7kg	15.0kg	14.1kg	13.3kg	12.4kg
108.0	17.8	15.2	14.3	13.4	12.5
108.5	18.0	15.3	14.4	13.5	12.6
109.0	18.1	15.4	14.5	13.6	12.7
109.5	18.3	15.5	14.6	13.7	12.8
110.0	18.4	15.7	14.8	13.8	12.9
110.5	18.6	15.8	14.9	14.0	13.0
111.0	18.8	16.0	15.0	14.1	13.1
111.5	18.9	16.1	15.1	14.2	13.3
112.0	19.1	16.2	15.3	14.3	13.4
112.5	19.3	16.4	15.4	14.4	13.5
113.0	19.4	16.5	15.5	14.6	13.6
113.5	19.6	16.7	15.7	14.7	13.7
114.0	19.8	16.8	15.8	14.8	13.8
114.5	19.9	16.9	16.0	15.0	14.0
115.0	20.1	17.1	16.1	15.1	14.1
115.5	20.3	17.3	16.2	15.2	14.2
116.0	20.5	17.4	16.4	15.4	14.3
116.5	20.7	17.6	16.5	15.5	14.5
117.0	20.8	17.7	16.7	15.6	14.6
117.5	21.0	17.9	16.8	15.8	14.7
118.0	21.2	18.0	17.0	15.9	14.9
118.5	21.4	18.2	17.1	16.1	15.0
119.0	21.6	18.4	17.3	16.2	15.1
119.5	21.8	18.5	17.4	16.4	15.3
120.0	22.0	18.7	17.6	16.5	15.4
120.5	22.2	18.9	17.8	16.7	15.5
121.0	22.4	19.1	17.9	16.8	15.7
121.5	22.6	19.2	18.1	17.0	15.8
122.0	22.8	19.4	18.3	17.1	16.0
122.5	23.1	19.6	18.4	17.3	16.1
123.0	23.3	19.8	18.6	17.5	16.3
123.5	23.5	20.0	18.8	17.6	16.5
124.0	23.7	20.2	19.0	17.8	16.6
124.5	24.0	20.4	19.2	18.0	16.8
125.0	24.2	20.6	19.4	18.2	16.9
125.5	24.4	20.8	19.6	18.3	17.1
126.0	24.7	21.0	19.7	18.5	17.3
126.5	24.9	21.2	19.9	18.7	17.5
127.0	25.2	21.4	20.1	18.9	17.6
127.5	25.4	21.6	20.4	19.1	17.8
128.0	25.7	21.8	20.6	19.3	18.0
128.5	26.0	22.1	20.8	19.5	18.2
129.0	26.2	22.3	21.0	19.7	18.4
129.5	26.5	22.5	21.2	19.9	18.6
130.0	26.8	22.8	21.4	20.1	18.7

DIRECTIONS FOR MEASURING CHILDREN WHO ARE 85 CM OR MORE IN HEIGHT

Step 1. Place the measuring board in a verticle position on a flat surface.

Step 2. Have the mother (or assistant) remove any footwear or headgear on the child and lead the child to the measuring board.

Step 3. Place the child so that the shoulder blades, buttocks, and heels are touching the vertical surface of the measuring board. The feet must be flat on the floor, slightly apart, legs and back straight, and arms at sides. The shoulders must be relaxed and in contact with the measuring board. The head usually is not in contact with the measuring board. Tell the child to stand "straight and tall" and look straight ahead.


Looking straight ahead
Shoulders relaxed
Arms at sides
Legs straight and knees together
Feet flat heels almost together
Shoulder blades, buttocks, and heels touching measurement surface
90°

Step 4. One assistant (the recorder) checks that the child stands flat footed with the knees fully extended. The shoulders and buttocks should be in line with the heels.

Step 5. The movable headboard is then brought to rest firmly on the crown of the child's head by the measurer while the head is held so that the child's eyes point straight ahead.

Step 6. The measurer reads the measurement to the nearest 0.5cm.

Step 7. The recorder then writes the measurement clearly on the form.

Step 8. The measurer then looks at the recorded value on the form to be sure that it is correct.

NCHS/CDC/WHO NORMALIZED REFERENCE

NOTE: Children who are over 85 cm in height who are too sick to stand may be measured lying down, but 1 cm should be subtracted from the measured length before using this table.

How To Measure Weight-For-Age

Find the child's age

When you are ready to weigh the child, write his birth date on a list. Then figure his age in months.

Weigh the child

It is best to use a small scale, so you can carry it with you and weigh each child at home. You can order a small hanging scale from this address:

CMS Weighing Equipment Ltd.
18 Camden High Street
London NW1 OJH
England

If you must use a large scale that is too big to carry, leave it at one house. After visiting each family, take the children to the scale and weigh them. Write each child's weight beside his age on your list.

Which children are MALNOURISHED?

For each child, you must know his weight and also the weight he should have at his age. If he weighs too little, he is MALNOURISHED. Look at the "Weight-for-Age List" on the next page. In the left column, you see the ages, 0-59 months. In the center column, you see that if a child of that age weighs less than a certain number of kilograms, he is MALNOURISHED. (The right column shows the "standard weight" for each age, but you will not need to look at that column.)

WEIGHT-FOR-AGE LIST

Age of the child	If the child weighs less than this amount he is MALNOURISHED	Standard weight for this age
0 months	2.4 kg*	3.2 kg*
1	3.1	4.2
2	3.7	5.0
3	4.3	5.7
4	5.0	6.4
5	5.4	7.0
6	6.0	7.5
7	6.4	8.0
8	6.8	8.5
9	7.2	8.9
10	7.6	9.2
11	7.9	9.6
12	8.1	9.8
13	8.4	10.1
14	8.6	10.4
15	8.8	10.6
16	9.0	10.8
17	9.1	11.0
18	9.2	11.2
19	9.4	11.4
20	9.6	11.5
21	9.8	11.7
22	9.9	11.8
23	10.0	12.0
24	10.2	12.1
25	10.3	12.2
26	10.5	12.4
27	10.6	12.6
28	10.8	12.8
29	10.9	13.0
30	11.0	13.2
31	11.2	13.4
32	11.3	13.6
33	11.4	13.8
34	11.6	14.0

WEIGHT-FOR-AGE LIST (Continued)

Age of the child	If the child weighs less than this amount he is MALNOURISHED	Standard weight for this age
35 months	11.7 kg*	14.2 kg*
36	11.8	14.4
37	12.0	14.6
38	12.1	14.7
39	12.2	14.9
40	12.4	15.0
41	12.5	15.2
42	12.6	15.4
43	12.8	15.5
44	12.9	15.7
45	13.0	15.8
46	13.1	16.0
47	13.3	16.2
48	13.4	16.4
49	13.5	16.5
50	13.6	16.6
51	13.8	16.8
52	13.9	17.0
53	14.0	17.1
54	14.1	17.2
55	14.3	17.4
56	14.4	17.5
57	14.5	17.7
58	14.7	17.8
59	14.8	18.0

How To Measure Arm Circumference

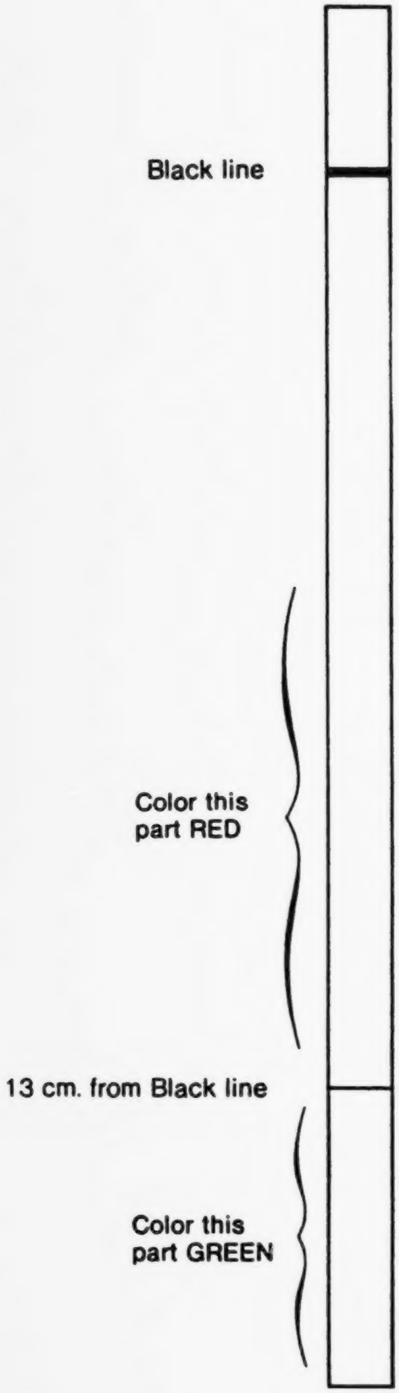
Age of the children

You should measure all children between 1 and 5 years old. If you do not know the exact age of a child, you can guess it:

- —If he has 0-3 teeth, he is **too young** to measure
- —If he has already lost some baby teeth, he is **too old** to measure
- —If he has 4-20 baby teeth, and he hasn't yet lost any teeth, he is the **right age** to measure.

Method #1: The colored strip

Ask a hospital to give you old X-ray films with clear spaces. Cut out clear strips of film, each 20 centimeters long. Or you can use pieces of strong cord or string. Use marking pens to color the black line, the red part, and the green part. The drawing is measured exactly, so you can use it as a pattern.



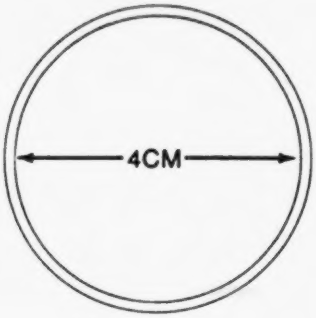
Measure the left arm of the child, half-way between his shoulder and his elbow. Your strip should just fit around the arm. Don't squeeze it.

—If the black line touches the red part of the strip, the child is MALNOURISHED

—If the black line touches the green part of the strip, the child is WELL-NOURISHED*

Method #2: The bracelet

Another way of measuring children's arms is with a bracelet. The bracelet must be exactly 4 centimeters in diameter (across the hole). That means it is 13 centimeters in circumference (around the hole).



You might find plastic bracelets in a shop, or you might ask a blacksmith to make some. Be sure the bracelets are the right size. The drawing is measured exactly, so you can use it as a pattern.

Or you can order a package of 10 bracelets from this address:

TALC
30 Guilford Street
London WC1N 1EH
England

Measure the left arm of the child. Push the bracelet up the arm in one straight push. Don't twist it or force it.

—If the bracelet goes above the elbow, the child is MALNOURISHED

—If the bracelet stops at the elbow, the child is WELL-NOURISHED

(Adapted From: Brown, R. and Brown, J., Finding The Causes of Child Malnutrition. pp. 30-53.)

Reasons for special care

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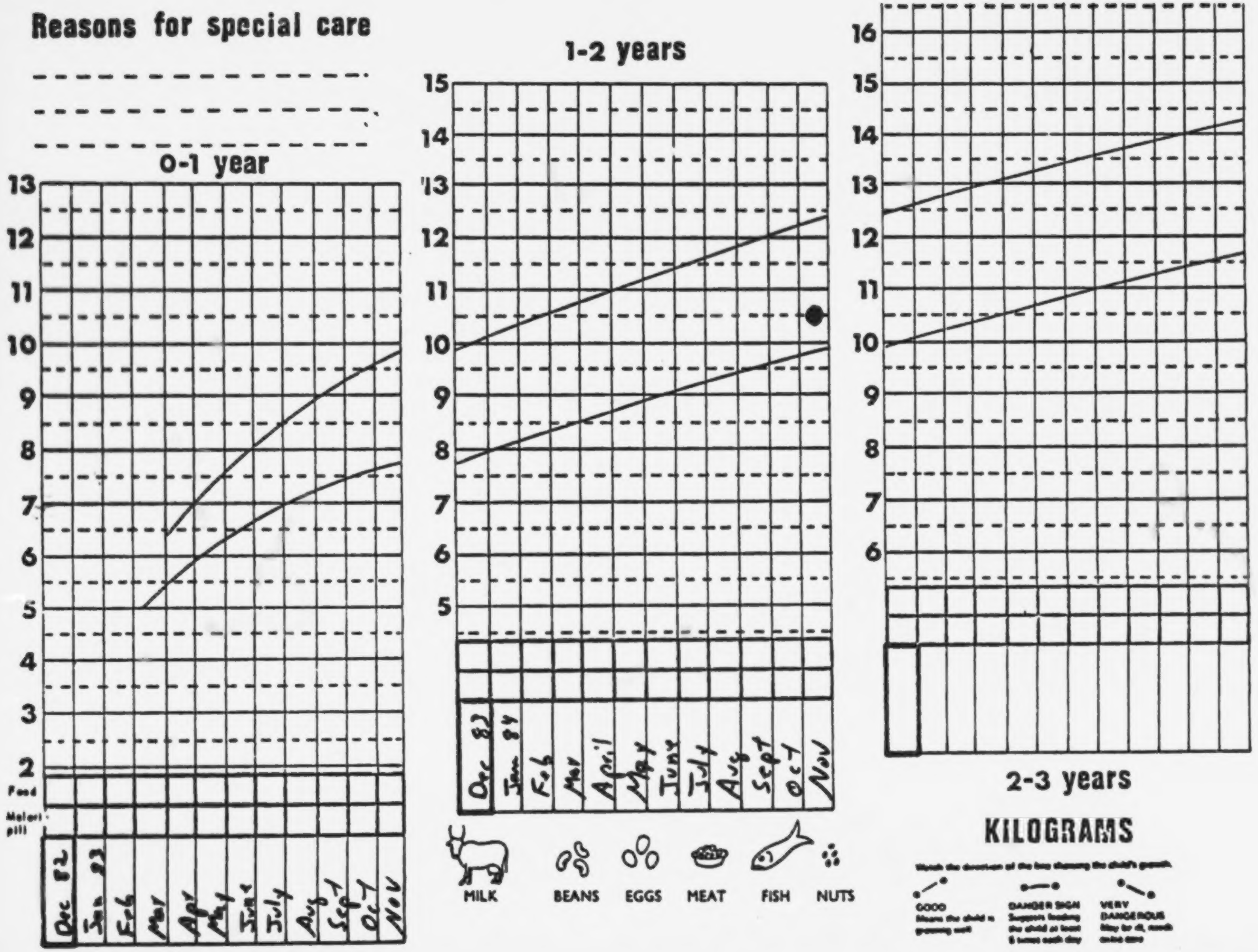
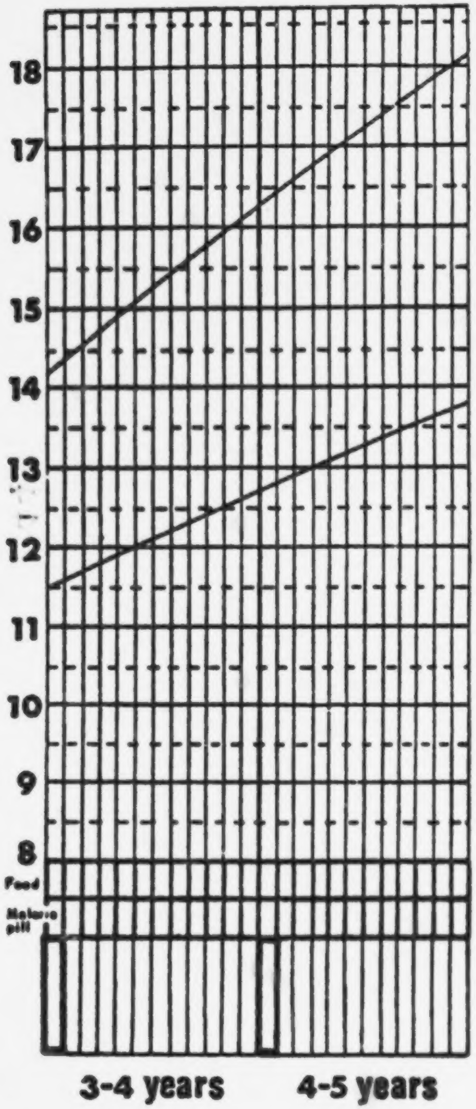


ROAD TO HEALTH CHART

Session 29, Handout 29B
Page 1 of 2

Under fives clinic



CLINIC	CHILD'S No.
CHILD'S NAME Boy/Girl	
MOTHER'S NAME	REGISTRATION No.
FATHER'S NAME	REGISTRATION No.
DATE FIRST SEEN	BIRTHDAY
WHERE THE FAMILY LIVE	

USING A WEIGHT CHART

Ask the child's mother the month and year of his birth. If she does not know these, you will have to use a local events calendar.

Write the month of the child's birth, say March, in all the thick black lined boxes on the child's weight chart. These are the first boxes for each year.

Write the other months in the other boxes.

Put the year (for example '79) opposite each January, and each birth month.

Weigh the child.

Make a dot for the child's weight opposite the month you are in. Make a big dot, about 3 mm. If you are near the beginning of the month, put the dot at the left of the column for that month. If you are in the middle of the month, put the dot in the middle of the column. If you are at the end of the month, put the dot at the right of the column.

The solid lines across the chart are for whole kilograms. The lines with dots are for half kilograms. For example, if your child weighs a little less then 6·5 kg, put your dot a little below the dotted half kilo line for 6.5 kg.

When a child has several dots, join them up with *thick* lines to make a growth curve.

ANTI-TUBERCULOSIS IMMUNISATION (BCG)

Date of BCG immunisation_ _ _ _ _ _ _ _ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

(BCG can be given immediately after birth)

POLIOMYELITIS IMMUNISATION

Date of first immunisation_ _ _ _ _ _ _ _ _ _

Date of second immunisation_ _ _ _ _ _ _ _ _

Date of third immunisation _ _ _ _ _ _ _ _ _ _

WHOOPING COUGH, TETANUS &
DIPHTHERIA IMMUNISATION

Date of first injection _ _ _ _ _ _ _ _ _ _ _ _
(at the age of one month or later)

Date of second injection_ _ _ _ _ _ _ _ _ _ _ _
(one month after the first injection)

Date of third injection_ _ _ _ _ _ _ _ _ _ _ _
(one month after the second injection)

MEASLES IMMUNISATION

Date of immunisation _ _ _ _ _ _ _ _ _ _ _ _
(at the age of 9 months)

Session 29, Handout 29D

ANTHROPOMETRIC MEASURES RECORDING SHEET

Small group #____

Small Group Member's Measures

#1 Child Name__________	#1	#2	#3
Height/Length (in cm. or inches)			
Weight (in lbs and ozs. or kilograms and gms.)			
Arm circumference (in inches or cm.)			

Age ________

Other Child Information:

#2 Child Name__________	#1	#2	#3
Height/Length (in cm. or inches)			
Weight (in lbs and ozs. or kilograms and gms.)			
Arm circumference (in inches or cm.)			

Age ________

Other Child Information:

*Note: If more than 2 persons are measured, use the back of this sheet for recording the same information.

KWASHIORKOR

Definition

Kwashiorkor is a state of chronic protein deficiency in a child, usually 1 to 5 years old, who has been wholly or partially weaned without adequate substitution of other foods containing proteins of adequate quality and quantity. The child's diet usually consists mainly of maize, cassava (manioc), plantain, or other predominantly carbohydrate foods. The name is derived from a term used by a tribe in Ghana and is said to mean the sickness an older child gets when the next baby is born, i.e., it commonly results when a pregnancy displaces an older child from the breast.

Signs and symptoms (with reference to dark-skinned Africans).

Beginning with the head: (note Figure 1).

1. The hair is often scanty and discolored and tends to be reddish or greyish, with weak roots (which can be pulled out easily).
2. The face is usually puffy ("moonface"), with oedema under the eyes and cheeks.
3. There is oedema of the hands and legs.
4. The child is short for his age.
5. The skin is smooth and a characteristic dermatosis, consisting of areas of disquamation and pigmentation along with areas of depigmentation, is often present. The skin tends to peel and flake, ulcers may occur over pressure points and deep cracks may be present in skin folds. Severe cases may resemble extensive burns.
6. The pot belly is often filled with worms.
7. The child is not a happy child. He is apathetic, irritable, and cries when strangers interfere with him. He tends to remain aloof and to stay where he is put.
8. His muscles are wasted, but some subcutaneous fat still exists. His arm circumference is small for his age.

9. He has a poor appetite and frequently has diarrhoea and loose stools.

10. The child is usually anaemic. His skin is pale, and the conjunctiva of his eyes are pale.

Of the above signs, the following are especially characteristic:

1. Oedema is present (face, feet and legs, hands, etc.).
2. The muscles are weak and wasted though with preservation of some subcutaneous fat.
3. Skin changes.
4. Growth failure is seen in low height and weight (once the oedema is corrected) for age.
5. There are behavioral changes manifested by misery, apathy, lack of appetite, withdrawal, etc.

Kwashiorkor

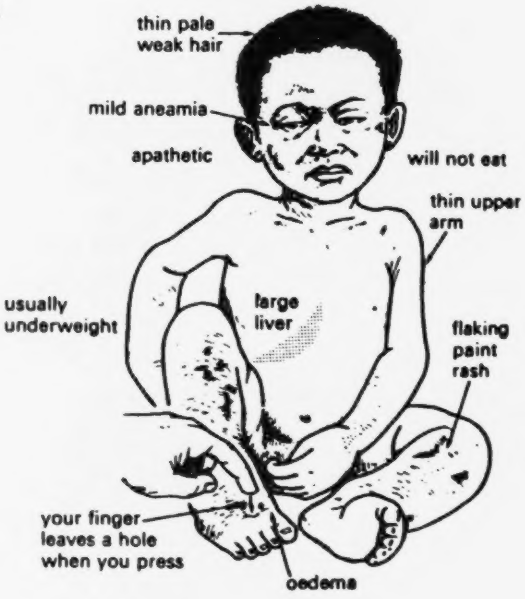

thin pale weak hair
mild aneamia
apathetic
will not eat
thin upper arm
usually underweight
large liver
flaking paint rash
your finger leaves a hole when you press
oedema

Figure 1:

TREATMENT OF KWASHIORKOR

Severe cases are admitted to the hospital with, if necessary, I.V. drips and naso-gastric feedings. If the child is considerably dehydrated, isotonic solutions of electrolytes with added glucose is recommended by mouth or, if necessary, I.V.

Dietary treatment

Good dietary sources of digestable protein and energy must be administered. This is usually given in the form of a milk formula, consisting of dried low fat (skimmed) milk or whole milk plus carbohydrates (sugars) and fats (vegetable oil seeds). Milk substitutes of vegetable origin, composed of carefully selected proteins to give a good combination of amino acids may also be used. Skim milk alone will not provide sufficient calories and in excessive amounts may cause diarrhea.

The total amount of fluid in the beginning should be about 1150 cc of liquid per day. This is divided up and given 4 or more times per day. The amount is then adjusted according to the observed need of the particular child, depending upon the weight* of the child and the observed losses of fluid in diarrhoea and vomiting. Note that the formulas below must be made up twice a day to provide the required amount of liquid.

* Maintenance oral fluids are calculated as follows:

100 cc/kg for the 1st 10 kg of weight
50 cc/kg for the 2nd 10 kg
20 cc/kg for kg over 20

For example a 15 kg child would need 10 x 100 = 1000 + 5 x 50 = 1250 cc/day

47

Examples of formulas:

1. Dried skimmed milk: 20 level teaspoons (5-6 cc volume) of milk powder, 4 level teaspoons of sugar (preferably brown sugar, or glucose), 6 level teaspoons of edible oil (sesame, cottonseed, maize, soya, sunflower, etc.) and 550. cc of boiled water (about 20 fluid ozs.)

2. Full cream milk powder: 20 level teaspoons of milk powder, 4 level teaspoons of sugar, 550 cc of boiled water (about 20 fluid ozs.)

3. Boiled liquid cow's milk: 550 cc (20 fluid ozs.) plus 4 level teaspoons of sugar.

4. Evaporated milk: 1 part milk to 2 parts boiled water make 550 cc (20 fluid ozs.) plus 4 level teaspoons of sugar.

Depending on the condition of the child, feeding is accomplished by means of an intra-gastric plastic polyethylene tube, a milk drip, or by giving calculated feeds by syringe or spoon every few hours.

A broad spectrum of foods eaten locally should be introduced to the child as soon as he begins recovering. In addition to the digestible, chewable forms of meat, fish, and eggs, good quality vegetable protein should be encouraged if possible. We know that the child is recovering when he looks brighter, is eating with some appetite, and is showing interest in his environment. He will lose his irritability and begin to play. Weight improvement is early; return of normal hair and growth rate are much slower.

Stool should be checked and deworming done as indicated (after the child has passed the acutely ill stage). The dermatosis, if severe, should be treated with oil and carefully protected. Any vitamin deficiencies present should also be treated.

(From: Joseph, F., Protein-Calorie Malnutrition. pp. 9-10.)

MARASMUS

Definition

Marasmus is an extreme deficiency of proteins and calories. The marasmic child is a starved child, thin, but often more alert and less indifferent to what goes on around him than is the child with kwashiorkor. Marasmus is seen in children in drought-stricken areas; for example, recently in the Sahel region of the sub-Saraha.

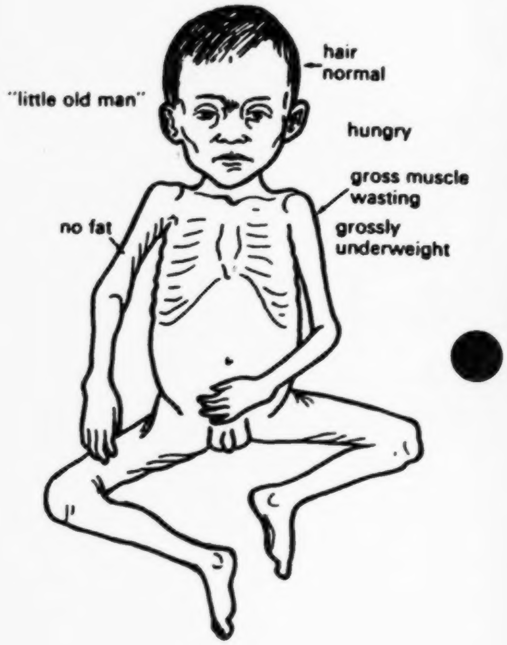
Signs and symptoms

1. There is marked wasting of muscles and subcutaneous fat. (Subcutaneous fat is less affected in kwashiorkor.)
2. It generally occurs before the age of one. However, late marasmus does occur in areas of severe food scarcity.
3. There is growth failure, as in kwashiorkor, but usually more marked.
4. The psychological change in marasmus may be less marked than in kwashiorkor.
5. Sunken eyes give the look of a "little old man."
6. The head seems large as compared to the body, and the face is thin (as compared to the "moonface" of kwashiorkor).
7. The skin can be lifted off like folds, especially in the buttocks area, giving the "skin and bone" appearance (as compared to the oedematous look of kwashiorkor).
8. The hair is usually not changed (unless in a case of kwashiorkor-marasmus combination).
9. There may be signs of dehydration.

Of the signs above, there are 5 which are usually found:

1. Wasting of the child's muscles and the subcutaneous fat
2. Severe growth failure (low body weight, not much or any change in height)
3. Most are very hungry though a few are anorexic. More interest in the environment is usually maintained than in kwashiorkor.
4. The hair is more or less normal
5. There is usually no oedema

Marasmus


hair normal
"little old man"
hungry
gross muscle wasting
no fat
grossly underweight

50

TREATMENT OF MARASMUS

1. Dietary

Severe cases should be hospitalized. Basically, treatment is like that of kwashiorkor (see TREATMENT OF KWASHIORKOR). Recovery, however, is a bit slower.

Feeds can be increased if and when the child can eat. Because both calories and proteins are markedly deficient, more carbohydrates and fats are added to the daily diet.

The child may have avitaminoses. Check for signs and symptoms and provide supplemental vitamins if considered necessary.

2. Educational

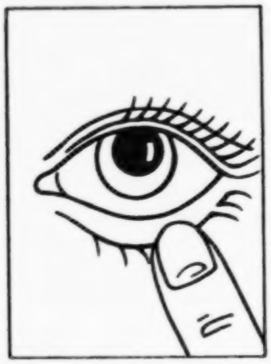
Education should be provided in the same manner as for kwashiorkor, including the socio-economic considerations mentioned. However, in the case of regional failure or destruction of crops, the government may have to assume responsibility for providing food and other essential supplies and services.

Marasmus-Kwashiorkor

The two syndromes, kwashiorkor and marasmus, are the extremes of a continuous spectrum since every degree of relative deficiency of protein and calories can be found. The large majority of cases of kwashiorkor shows some loss of subcutaneous fat and tissue wasting as well as the oedema and other signs and symptoms of protein deficiency. They might more properly be referred to as cases of kwashiorkor of the marasmic type or marasmus-kwashiorkor. Treatment and management of such cases follow the same principle which have been described for classical cases of kwashiorkor.

(From: Joseph, F., Protein-Calorie Malnutrition. pp. 25-27.)

Detecting Anemia and Vitamin A Deficiency



Anemia

Anemia, the reduction in the concentration of hemoglobin (or red pigment) in the blood, causes varying degrees of debility, which interferes with an individual's ability to carry out daily tasks. Severe anemia during pregnancy is associated with increased rates of maternal morbidity and mortality, as well as higher risk to the fetus. Anemia usually results when the body lacks sufficient stores of iron or folic acid, needed to produce red blood cells. Shortages of these key building blocks can be caused by dietary deficiency and/or by parasitic infections such as malaria or hookworm that involve red blood cell loss. Bacterial infections and hemoglobin disorders (like sickle cell disease) also contribute to the development of anemia.

Infants, and women in their reproductive years, are especially vulnerable to anemia. During the last trimester of pregnancy, iron is transferred to the fetus across the placenta. A child born to an iron-deficient mother will probably have insufficient stores of iron. The rapid rate of growth of children increases their iron requirements. Iron stores may be quickly depleted, even in a child born with adequate iron levels.

In spite of the high prevalence and negative health impact of anemia in developing countries, a simple, reliable, and inexpensive method to detect anemia is not yet available. Although there have been many advances in the development of sophisticated instruments to detect anemia, the cost of these technologies does not permit their widespread use in primary health care programs. In the absence of an affordable detection instrument, health workers must rely on older, less reliable methods.

One way to screen for anemia is to examine the patient for signs of pallor. The inner surface of the lips and the inner side of the lower eyelids are pale, light pink, or white in anemic individuals. If it is difficult to judge degrees of pallor, a person suspected of being anemic can be compared to a healthy person whose normal skin color is as dark or light as that of the person being checked. Also, standard color photographs showing the lips and tongues of healthy and anemic people can be used for direct comparison. The "anemiometer," a strip of paper with three bands of different shades of red, is used to measure mild, moderate, and severe anemia. The health worker holds it up to a person's inner eyelid and matches the color. It should be emphasized that these tests are not very reliable, except in cases of severe anemia.

The other common technologies for detecting anemia — hemoglobin concentration and hematocrit — require laboratory facilities, which may not be available, and a blood sample, which some people may object to giving.

To measure hemoglobin concentration, a measured sample of blood is taken from a finger prick and mixed with a known volume of diluting fluid. The depth of color of the diluted blood is determined in a spectrophotometer or colorimeter. Some photometers run either on electricity or on current from a car battery. The colorimeter must be calibrated, and a graph and table prepared for the hemoglobin values. Alternately, a comparator can be used. This is a visual method where the test solution is compared with a series of colored glass standards that show the concentration of hemoglobin. Another approach is the Sahli method, in which blood is diluted in an acid solution, converting hemoglobin to acid hematin. The test solution is then matched against a colored glass reference. This method is often used because it does not require expensive instruments, but it is not an accurate way of estimating hemoglobin.

The traditional unit for expressing hemaglobin concentrations is grams per 100 ml, with the following values considered as cut-off points for defining marginal deficiency states: non-pregnant women, 12.0 g/100 ml; pregnant women, 11.0; men, 13.0; children at birth, 13.5; children at one year, 11.5; and children 10-12 years, 11.5. The problem with such standards is that there is no clear-cut dividing line between normal and iron-deficient people. What is normal value for one person may not be for another.

The hematocrit, or the packed cell volume, measures the volume of red blood cells in a volume of blood. In the microhematocrit method, a blood sample is taken from a finger prick, allowed to flow into a capillary tube, and centrifuged to separate the cells and the plasma. The centrifuge must be driven from a source of electric power. The packed cell volume is found by measuring the length of the column of red blood cells and expressing this as a percentage of the total length of the whole sample.

Neither laboratory tests nor clinical examination can give a precise determination of the cause of anemia — whether it is due to an iron deficiency, other nutrient deficiencies, infection, hemorrhage, or a combination of these. Further blood tests may be needed.

Vitamin A Deficiency

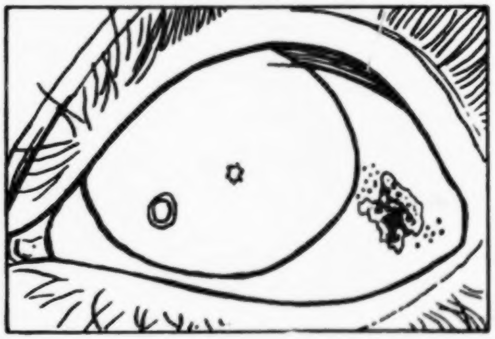
Xerophthalmia is an eye disease that results from vitamin A deficiency and is the primary cause of blindness among children in the developing world. Inadequate vitamin A status can vary from marginal deficiencies without clinical signs, to the presence of early and reversible clinical signs (night blindness, Bitot's spots, and conjunctival xerosis), to severe depletion with advanced and irreversible corneal changes and a high probability of blindness. Children with protein-energy malnutrition, respiratory infections, measles, and/or diarrhea are at especially high risk of developing vitamin A deficiency. Recent research has found that even children with mild xerophthalmia may have a much higher mortality rate than children without apparent deficiency.

Simple techniques for assessing vitamin A status and xerophthalmia should be part of primary health care programs, especially in areas where vitamin A deficiency is endemic. Because biochemical tests, although accurate, are not always practical, primary health care workers need to be trained to recognize the clinical signs of vitamin A deficiency.

Night blindness is frequently the earliest symptom of vitamin A deficiency and can even occur when biochemical tests indicate that vitamin A status is adequate. Until recently, an objective measure of scotopic vision (ability to see in the dark) in preschool age children was very difficult to obtain, because it required the child's cooperation. A study in Indonesia demonstrated that a **history** of night blindness, elicited from a child's parent or guardian, can be valid evidence of vitamin A deficiency. The key to obtaining this history is the existence of local term(s) for the condition, such as "chicken blindness." Reports from other countries indicate that, in areas where vitamin A deficiency is chronic, local terms usually do exist. However, this technique of history taking may not be valid for cultures without such terms. These findings merit further research, as this is a technique which requires little training and no clinical experience. Even school children could be taught to screen their younger siblings.

The other eye signs associated with vitamin A deficiency can only be recognized by clinical examination. Color photographs and line drawings depicting the changes in the eye, accompanied by brief texts describing the photographs, are the simplest and most commonly used tools. These can be used to train workers, who can carry these photographs and drawings with them, referring to them as they examine a child's eyes (see drawing below left). Film strips, slide shows, and manuals are also available for training and reference.

Another finding of the study in Indonesia that is potentially useful for identifying individuals and groups of people at risk of xerophthalmia is the neighborhood clustering of vitamin A deficiency. This also needs further research in other countries.



Helen Keller Int'l, NY

Example of diagnostic eye drawing showing foamy Bitot's spot.

(From: PATH. Health Technology Directions. Third Quarter, 1983. pp. 8-9)

COMPARISON OF ANTHROPOMETRIC MEASURES

Indicator	*Advantages*	*Disadvantages*	*Comments*
1. Weight-for-Age	• Good basic indicator, combining acute and chronic malnutrition, for monitoring ongoing programs (125, 136). • Sensitive to small changes (although many variables influence small fluctuations in weight) (82). • Measure is objective and repeatable (82). • Sole tool (scale) is portable and relatively inexpensive. • Weighing is relatively easy for inexperienced health workers to manage, although it does require a literate worker. • Measure is not time consuming.	• Not sensitive to a stunted child who is growing well (below but parallel to a normal growth channel) (8, 27) or to the very tall child who may be malnourished (1). • Relies on age data, which are often subject to error. Age data for children below two years old have been found accurate, or, if in error, easily corrected, but it is difficult to accurately estimate unknown ages for children over two years (76). • Mothers in some countries have objected to hanging their children from the scale during weighing (67).	• Better if used with children 0-2 years because height retardation is less pronounced (125); however, it is a valid indicator through the preschool years.
2. Length/Height-for-Age	• Good indicator of past nutrition problems (125). • Measure is objective, repeatable, and has a low variability (82). • A length and height board can be made locally for a minimum investment, and the boards are easily transported. • Rarely are mothers reluctant to have child measured because of appearance of the board.	• In growth monitoring projects it should be supplemented by another indicator like weight-for-age or weight-for-height because changes in height occur relatively slowly. • Requires two different techniques if programs include all preschoolers: recumbent (lying down) length (children 0-2 years) and standing height (children 3-5 years). • More difficult for unskilled workers to learn to take accurate length/heights than to weigh a child with a simple scale. • Requires two persons to take the measure. • Relies on age data, which are often subject to error.	
3. Weight-for-Length/ Height	• Good indicator to distinguish those who are well proportioned (weight/height) from those who are thin (or heavy) for their height (8, 122). • Indicator does not require age data, which are often inaccurate and difficult to obtain. • Measures are objective and repeatable.	• Depending on the cut-off points chosen (see Chapter III), weight-for-height can underestimate malnutrition by classifying those who are short and thin as normal (102, 106). • Requires taking two measures; therefore, problems of purchasing or making the instruments and transporting them are compounded. • Weighing and measuring height will require more training time and may be too complicated and time consuming for the inexperienced clinic worker to do with frequency. • Some mothers may be reluctant to have their children weighed. • Requires two persons to take length or height measure.	

Indicator	*Advantages*	*Disadvantages*	*Comments*
4. Arm Circumference	• Indicator of severe current malnutrition (1), whether or not stunting is present (8). • While it may not detect changes as rapidly as weight monitoring, it will indicate changes in nutritional status over a short time. • Measurement is taken with an inexpensive and portable arm tape, which can be made by project personnel. • Quick to use. • Arm tape can be color coded for use by non-literate health workers. • Indicator does not require age data, which can be inaccurate and difficult to obtain. • No known objection by community to this measure.	• Will only identify children with severe malnutrition. It is more difficult to determine who is borderline. • Variability is high on measurement. Field workers need practice taking measurement to do it accurately. Finding the *mid*-upper arm and placing the tape around the arm without compressing the tissue is difficult.	• Some researchers indicate that measure should be used only with children 1-3 years old (7, 96), although others say it is valid for children 1-5 or 6 years old (106), and that it can be used beginning at 6 months (132).

ANTHROPOMETRIC INDICATORS FOR CHILDREN

Indicator	What Does It Measure?
Weight-for-age	wasting and stunting[*] combined
Height-for-age	stunting
Weight-for-height	wasting
Arm circumference	wasting

[*] **Wasting**, which is extreme thinness, reflects acute, current malnutrition; **stunting**, which is retarded skeletal growth, reflects chronic, long-term malnutrition.

(From: APHA. Growth Monitoring. 1983. pp. 11-12. and PATH. Health Technology Directions. Third Quarter, 1983. p. 3.)

GUIDELINES FOR INTERPRETING NUTRITION SURVEILLANCE DATA

TABLE 1. Weight-for-Age

System	*Reference Population*	*Method*	*Classification*
Gomez (46)	Boston	% of median	> 90%: normal 90-75%: mild malnutrition (grade 1) 75-61%: moderate malnutrition (grade 2) ≤ 60%: severe malnutrition (grade 3)
Jelliffe (61)	Boston	% of median	110-90%: normal 90-81%: mild malnutrition (grade 1) 80-61%: moderate malnutrition (grades 2 and 3) ≤ 60%: severe malnutrition (grade 4)
Bengoa (16)	Boston	% of median	Gomez classification with all cases of edema added to the category of severe malnutrition
Kasa Project, India (104)	Boston	% of median	> 65%: not at risk ≤ 65%: high nutritional risk
WHO (129)	NCHS	Percentile	50th-3rd percentile: normal ≤ 3rd percentile: malnourished
Tamil Nadu (49)	Indian Council of Medical Research	Absolute weight gain	6-11 mo.: 500 gm/months: normal 12-35 mo.: 500 gm/3 months: normal anything less is inadequate
Candelaria Project Columbia (35)	Boston	% of expected gain	< 85% of expected weight gain shows nutritional risk
Indonesia (20)	Boston	% of median + weight gain	Gomez classification on chart but records kept by weight gain; gaining weight each month: normal; no weight gain: at risk

TABLE 2. Height-for-Age

System	*Reference Poulation*	*Method*	*Classification*
Kanawati and McLaren (65)	Boston	% of median	≥ 95%: normal 95-90%: mild malnutrition 90-85%: moderate malnutrition 85%: severe malnutrition
WHO (39)	Boston	% of median	105-93%: normal 93-80%: short < 80%: dwarf
CDC (37)	NCHS	% of median	≥ 90%: adequate < 90%: stunted or chronically undernourished

TABLE 3: Weight-for-Height

System	*Standard*	*Method*	*Classification*
McLaren/Read (79)	Boston	% of median	110-90%: normal 90-85%: mild malnutrition 85-75%: moderate malnutrition <75%: and/or edema; severe malnutrition
Waterlow (125)	Boston	% of median	110-90%: normal 90-80%: mild malnutrition 80-70%: moderate malnutrition <70%: severe malnutrition
Viteri/Beghin (121)	Boston	% of median	< 92%: warning sign (needs clinical exam)
Patulul Project, Guatemala (34)	Boston	% of median	>90%: normal 90-81%: moderate malnutrition ≤80%: severe malnutrition
CDC (37)	NCHS	% of median	85-80%: moderate malnutrition <80%: wasted/acute malnutrition
NCHS (90)	NCHS	Percentile	75th-25th: normal 10th-5th: moderate malnutrition <5th: severe malnutrition

TABLE 4. Weight-for-Height and Height-for-Age

System	*Reference Population*	*Method*	*Classification*
Waterlow (125)	Boston	% of median	(see above for actual percentages) adequate weight/height and height/age: normal low weight/height, normal height/age: acute malnutrition normal weight/height, low height/age: chronic malnutrition low weight/height and height/age: chronic and acute malnutrition

TABLE 5: Arm Circumference

System	*Reference Population*	*Method*	*Classification*
WHO (39) and Shakir (106)	Wolanski 16.5 cm.	% of median	>85% or >14 cm.: normal 85-76% or 14-12.5 cm.: malnutrition <76% or <12.5 cm.: severe malnutrition

(From: APHA. Growth Monitoring. 1983. pp. 16-17)

EXAMPLES OF INFORMATION TO BE RECORDED ON A GROWTH CHART

These examples or ones that you have collected from local records or Handout 29C that you developed or provided, should be given to the group for plotting and interpretation.

A girl was born in May 1976. Her name is Laxmi. She was weighed on different months following her birth. The weights in each of the months are given below.

1976	May	3.0 kg
	June	4.0 kg
	July	4.5 kg
	August	5.5 kg
	September	6.0 kg
	October	6.5 kg
	November	Did not attend
	December	7.0 kg
1977	February	Had measles
	March	6.5 kg Had diarrhoea
	April	6.0 kg Put under special nutrition care
	May	6.5 kg
1977	June	7.5 kg
	September	9.0 kg
	October	10.5 kg
	December	11.5 kg
1978	January	11.5 kg Stopped breast-feeding
	February	11.5 kg
	April	10.5 kg
	June	12.0 kg
	July	11.5 kg
	November	12.0 kg Brother born
	December	11.5 kg
1979	February	11.5 kg
	April	12.5 kg

Tola and her twin sister were born in March of 1984. Their mother died during delivery. Tola's weights in each of the months is given below:

1984	March	2.0 kg	September	7.5 kg	
	April	2.5 kg	October	9.0 kg	
	May	-	November	4.5 kg	
	June	3.0 kg	December	4.0 kg	Had diarrhea
	July	3.75 kg			
	August	-			

The following is the Growth Chart of Romen, born October of 1977.

1977	October	3.5 kg	
	November	5.0 kg	
	December	-	
1978	January	6.5 kg	
	February	-	
	March	8.0 kg	
	April	-	
	May	9.5	
	June	-	
	July	9.5	
	August	-	
	September	10.75 kg	
	October	7.5 kg	
	November	-	
	December	-	
1979	January	-	
	February	-	
	March	-	
	April	11.0 kg	Fever
	May	-	
	June	11.5 kg	Swelling
	July	11.0 kg	Special Care
	August	11.5	
	September	-	
	October	-	Sibling born
	November	11.5 kg	
	December	-	
1980	January	12.5 kg	

The following weights are for Jose who is the first and only child of a couple who have been married for 10 years. Jose has only been bottle fed. He was born in February of 1975.

1975	February	3.5 kg		1976	February	-
	March	-			March	6.5 kg
	April	4.0 kg			April	-
	May	-			May	5.5 kg Pneumonia
	June	4.5 kg			June	-
	July	-			July	6.5 kg
	August	4.5 kg	Diarrhea		August	
	September	4.5 kg			September	7.5 kg
	October	-			October	-
	November	5.0 kg			November	8.5 kg
	December	-			December	
1976	January	5.5 kg.		1977	January	9.5 kg

Session 30

BREASTFEEDING AND WEANING

TOTAL TIME 4 hours

OVERVIEW

If an infant is properly fed during the first year, he or she will grow well and have a good start in life. Breastfeeding and nutritious weaning foods are the best ways to ensure good growth and reduce the risk of malnutrition in the second and third years. The six to twelve month period in a baby's life is the time when either good or poor nutrition begins.

During this session, participants discuss the myriad advantages of breastfeeding and examine the problems which result when the latter is practiced. During the second part of the session, the group participates in a demonstration of the preparation of weaning foods and learn basic guidelines for the introduction of supplementary foods into a baby's first year diet. At the end, the group practices making weaning foods using locally available foods.

OBJECTIVES

- To describe and compare the advantages and disadvantages of breastfeeding and bottle feeding.
  (Steps 1-3)
- To describe the weaning process and discuss important principles of what, when, and how much of the new foods to give a baby during the first year.
  (Steps 4 and 5)
- To examine several methods and food sources to improve weaning foods in the local area.
  (Step 6)
- To practice making nutritious weaning foods using locally available foods.
  (Step 7)

RESOURCES

- Infant Nutrition in the Subtropics and Tropics. Chapters 5 and 6.
- Guidelines for Training Community Health Workers in Nutrition. pp. 45-71
- Breastfeeding and Weaning. Peace Corps Resource Packet #12.

Handouts:
- 30A Local Practices Regarding Infant Feeding
- 30B Questions & Answers About Weaning
- 30C Guidelines for Weaning
- 30D Methods & Food Sources to Improve Weaning Foods

Trainer Attachments:
- 30A Story of a Bottle-Fed Child
- 30B Breastfeeding and Bottle Feeding: Advantages and Disadvantages
- 30C The Story of Maya
- 30D Sample Problems in Infant Feeding

MATERIALS Posters, flip-charts, flannel board or other visual materials for the weaning presentation in Step 4; local foods, equipment, utensils and cooking area for preparing multimixes in Step 7; newsprint and markers.

PROCEDURE

Trainer Note

Discussions of infant feeding included in this session should be coordinated with activities and sessions you may conduct using Module 6, Maternal and Child Health.

If possible, select a participant from the group to present the Story of a Bottle-fed Child in Step 2.

The presentation and demonstration on weaning foods in Step 4 could be done by any one of several people: the trainer, a local health worker, a PCV working in nutrition, or one of the Trainees if the group has been in-country long enough to be familiar with the culture.

For Step 7, where participants practice making weaning foods, set-up a kitchen area with locally appropriate equipment, utencils, and food items. Pre-cook any of the foods that require considerable cooking time (e.g., grains and legumes).

Step 1
(15 min)

Infant Feeding in the Community

Review the session objectives and begin a dialogue on infant feeding. Ask participants to remember field trips to the community or clinic, any visits at the homes of local families, and other occasions where they have had an opportunity to observe and talk to mothers with small babies. Have participants share any information they may have gathered about breastfeeding and bottle-feeding practices in the local community. Stimulate discussion with the questions:

- Do all mothers in the community breastfeed their babies?
- For how many months does a mother breastfeed her baby?
- What feeding practices are forbidden (what are the food taboos)? (For example, in some areas breastfeeding during pregnancy is forbidden. In some places feeding colostrum, the fluid from the breasts in the first day after delivery, is a taboo.)
- What food or drink is given to the baby when the mother goes out to work?
- If a mother is bottle feeding her baby, why did she decide to feed the baby in that way? What mixture does she feed him?

Help the group with the questions they can't answer to the extent they have an overall picture of how infant feeding occurs in their host communities.

Trainer Note

In this session, the discussion of breastfeeding should focus mostly on the infant and his or her nutrition. Breastfeeding issues which more closely concern the mother (e.g., complications in milk production) are treated in Module 6, Maternal and Child Health.

Step 2
(25 min)

Story of a Bottle-Fed Child

Read the story from Trainer Attachment 30A (Story of a Bottle Fed Child) or describe an incident in which a child is malnourished and has diarrhea due to inappropriate bottle-feeding.

Afterwards facilitate a discussion of the problems of bottle-feeding in developing countries and its impact on infant health. Have participants generate a list of advantages and disadvantages of both breastfeeding and bottle-feeding. Ask someone from the group to record these on newsprint.

Trainer Note

Adapt the story in Trainer Attachment 30A or create your own given local practices and conditions. An alternative to telling a story is to show a film such as "Bottle Babies: or "Mothers in Conflict, Children in Need" (available from Health Sector, OTAPS, Peace Corps/Washington).

The discussion following the story of a malnourished bottle-fed baby should include the following points:

- Pre-disposing factors include: poor sanitation, inappropriate use of bottle, contaminated water, insufficient formula, poverty, inappropriate advertising. . .
- The precipatating cause of malnutrition and diarrhea was the incorrect use of the bottle and formula given the existing circumstances.
- There are many reasons why the mother might choose bottle feeding: for its status value, because she believes it's the modern way, she has to work, she has been told it is "better" for her baby, she feels breastfeeding will make her breasts sag, she doesn't feel she has enough milk, or she's tired of breastfeeding after many pregnancies.

The group should generate a list of advantages and disadvantages of of breastfeeding and bottle-feeding, similar to the list in Trainer Attachment 30B. Note that there are virtually no disadvantages of breastfeeding. Advantages of bottle-feeding would accrue primarily to a small percentage of women who are economically and socially well off.

If bottle-feeding is a major problem in the host country, assign participants some of the exercises on pages 60 and 61 of Guidelines for Training Community Health Workers in Nutrition.

Step 3
(15 min)

Promoting Breastfeeding

Have the group review their list of advantages and disadvantages. Ask them to briefly consider the PCV's role in promoting breastfeeding in the community. Facilitate the disucssion by asking:

- What might be major constraints to promoting breastfeeding in your job?
- What kinds of information do you need to know before promoting or discussing breastfeeding?
- What are some possible strategies for promoting breastfeeding?

Please note the points made in the Trainer Note below and include them in this discussion. Distribute Handout 30A (Local Practices Regarding Infant Feeding) and encourage participants to use the list of questions as a basis for finding out essential information once they get to their communities.

Trainer Note

The following paragraph from Guidelines For Training Community Health Workers in Nutrition summarizes the community health worker's role in relation to infant feeding:

> "Where breast-feeding is the normal practice in a community, little or no education is needed except for those with special problems. The traditional practice should be encouraged. In areas where traditional knowledge and practices are lost, especially in towns, education and personal support are needed. In many developing countries breastfeeding is usual in the the first year of life. Recently, there have been some influences which are changing this important practice. These influences include urban ways of life, women working away from their homes to earn additional incomes, the advertising of infant foods, and the idea that bottle-feeding is modern and therefore somehow better. This is wrong. Community health workers should act to reduce the effect of these bad influences on breastfeeding."

Step 4
(45 min)

Weaning Foods Demonstration

Ask a member of the group to define "weaning" in relation to the discussion thus far on breastfeeding. Tell the group that to learn more about the weaning process, especially in the context of the local culture, they will participate in a simulation. Explain the following scenario:

> "You are mothers attending a well-baby clinic with your children (under 5 years of age). Every month your children are weighed and their progress monitored. Each time the health educator has some activity for you to learn more about protecting your children's health."

When participants have assumed their roles, introduce yourself as the "health educator". Using local terms, names, and references to the local culture, present a story or health talk that discusses the weaning process. Include:

- Welcome in local language.
- Story that details the steps of the weaning process by discussing and illustrating foods to introduce at different developmental stages.
- Questions to mothers regarding what they could feed their child at each age. (i.e., Mari, now that your child is crawling, what will you feed him?).
- Demonstration of a weaning food - a slight adaptation of a traditional porridge for a 6-month old child (use local utensils, food and cooking materials; have some "women" help with the preparation).
- Tasting of weaning food.
- Local proverb or phrase that depicts the gradual but steady process of weaning a child and teaching him or her to eat (e.g., "Slow, slow, catch monkey in the woods").

Trainer Note

The presentation of the story and weaning food demonstration should be realistic to the local setting and should be an example of how participants might present nutrition education to a group of women. Use Trainer Attachment 30C (The Story of Maya), Handout 30B (Questions & Answers about Weaning) and the picture stories in Resource Packet #12, "Breastfeeding and Weaning", to develop a presentation that represents the local situation. Also, tape posters (e.g., of the three food groups) on the walls to help simulate the clinic environment.

Be sure your presentation and demonstration follow the weaning principles outlined in Handout 30C (Guidelines for Weaning).

Step 5
(30 min)

Processing the Weaning Foods Simulation

First ask participants to briefly comment on how it felt to be in the role of a village woman at the clinic and how effective the nutrition education was. Ask the group:

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(As village mothers in the role play)
- Did you feel involved in the learning?
- Were you interested in the information?
- Did you feel inclined to try the food or accept any advice the health worker gave regarding your child?

(As future health workers in your site)
- What were the most effective aspects of the presentation? Most ineffective?
- How culturally appropriate was the language? Materials?
- What problems would you have doing a presentation similar to this one?

Next ask the group to recall all the technical information on weaning they remember from the simulation. Have a discussion which addresses the main points included in Handout 30B (Questions & Answers about Weaning). Write the key ideas that come out of the discussion on newsprint for reference during the remainder of the session.

When participants have finished pooling their knowledge of the weaning process, distribute Handout 30B (Questions & Answers about Weaning) and 30C (Guidelines for Weaning). Have the group look over the information and ask about any points they don't understand. Ask participants to hold questions regarding multimixes for the next step.

Step 3
(15 min)

Methods and Food Sources for Improving Weaning Foods

Ask the group to review and discuss the explanation of multimixes on page 3 of Handout 30B (Questions & Answers about Weaning). Set out or have around the room some of the food items you purchased for their practice preparation. Have participants point out possible combinations or mixes from among the food items. Relate the amounts of multimixes and the three food groups which participants studied in Session 28. Briefly discuss how Volunteers can explain the concept of multimixes in a way that is understandable and acceptable in the local culture.

If relevant to the participants work assignments and the communities where they will live, distribute Handout 30D (Methods and Food Sources to Improve Weaning Foods). Help the group identify which types of preparation are most appropriate and feasible for local communities.

Step 7
(75 min)

Making Weaning Foods

Ask participants to form small groups and practice making a variety of weaning foods. Ask each group to first make a basic mix, then experiment with different foods to combine for multimixes. When participants have a number of dishes prepared, ask each group to describe their combinations to the others. Have everyone taste a little of each basic mix and multimix.

To close the session, give each small group one of the problems from Trainer Attachment 30D (Sample Problems in Infant Feeding). Explain that these are situations which Volunteers frequently encounter in the field. Ask the groups to decide and explain to the large group what the problem is and what advice they would give to the mother.

Trainer Note

As participants are sharing their various weaning foods with each other, encourage them to discuss the mixes in light of the cost, cultural acceptability, degree of difficulty in preparation, special equipment requirements and so forth.

If there are any women associated with the training center who have older babies, invite them to attend this part of the session and taste test some of the weaning foods with the children.

If possible, give the small groups their case problems at the beginning of this step so they can discuss the solution with members of their small group while they work at the stations.

LOCAL PRACTICES REGARDING INFANT FEEDING

The following questions seek information on local practices regarding breastfeeding; these are important to know before beginning any promotional or educational activities.

- Do most mothers breastfeed their babies? If not, how do they feed them?
- Up to what age are babies breastfed?
- At what point do mothers begin breastfeeding? Immediately after birth? At 2 days old?
- Is breastfeeding actively encouraged by doctors, nurses, midwives?
- What is the frequency of breastfeeding? on demand? hourly schedules?
- What is the baby fed if the mother goes out to work? Who feeds the baby?
- Is there an "indigenous formula"? e.g. a "gruel" or "pap" made for babies? What is it? How is it used?
- Are there beliefs about certain foods or local herbs that increase the milk output?
- What are the common problems encountered before or during breastfeeding?
- When do mothers feel that breast milk is insufficient and that other foods are to be given?
- What are the common foods given when weaning and in what form are they given?

Add other relevant questions, e.g. regarding the use of bottle and formula.

Questions And Answers About Weaning

The weaning age child is currently the subject of numerous efforts to reduce infant mortality and improve child health. This chapter answers some frequently asked questions about weaning and the weaning-age child. These answers summarize available information and are the basis for the program recommendations made in the paper. Health and nutrition issues are covered as well as determinants of weaning practices. This section draws on a number of references in the annotated bibliography and especially Cameron and Hofvander's "Manual on Feeding Infants and Young Children".

What is weaning?

Weaning is the transitional stage when a young child's diet gradually changes from one of milk alone to a diet based on what the family eats. Weaning begins when the child is introduced to foods other than breastmilk (or a breastmilk substitute) and is completed when the child is fully accustomed to the regular family diet. During weaning, the child should continue to be breastfed, since breastmilk is an important nutritional supplement to the weaning foods.

Weaning also has a social and psychological aspect. The special relationship between mother and child evolves as the child becomes more independent and other family members assume responsibility for the child.

Why is the weaning period a dangerous time for infants and young children?

During weaning the incidence of diarrhea and malnutrition is high, making the risk of mortality greater than at any other time in life.

The foods offered to the child and the preparation and storage methods used may cause health problems. The weaning food, in most cases, is a watery, starchy porridge that provides fewer nutrients than breastmilk at a time when the child's nutrition requirements are increasing rapidly to meet the demands of normal growth. The porridge may be prepared with contaminated water, unclean utensils and then stored for several hours before serving. The result is a food with enough harmful bacteria to cause gastroenteritis.

When should weaning begin and how long should it last?

The exact time for the introduction of food will depend on how well the child is growing. However, since rela-

During weaning, foods from the family diet are gradually added to the child's diet of breastmilk. Photo: World Neighbors tively few children participate in growth monitoring programs, the best advice is to begin weaning when a child is between 4 and 6 months of age. By that time children are able to swallow and digest bland semisolid foods without difficulty. Generally, between 4 and 6 months of age, the rapidly growing child needs food in addition to milk to ensure that nutrient requirements are met.

Both the early and late introduction of foods have been linked with child health problems. Introducing foods before 4 months leads to an increased incidence of diarrhea and may lead to increased mortality. On the other hand, the introduction of foods too late may mean nutrition requirements are not met, beginning the malnutrition process and leaving the child more vulnerable to other common childhood diseases.

The duration of the weaning period varies among cultures and communities because the duration of breastfeeding and the age when children eat adult foods differ. Weaning can be completed when the child is 12 months of age if the duration of breastfeeding is short and the transition to solid, "adult" foods rapid. Or, it can last through the second year of life in cultures where breastfeeding is prolonged and the introduction of foods from the family pot delayed.

How should foods be introduced to the weaning age child?

The introduction of foods should be gradual. First foods should be given using a teaspoon, a few spoonfuls at a time. The mashed or pureed first food can be given after breastfeeding if it is well accepted or before breastfeeding (when the child is hungry) if acceptance is a problem. Initially, the food can be given once a day, but within a month, the quantity, frequency, and types of food should increase. By 6 months the child should receive food 2 to 4 times a day. Children learning to eat often spit out the food. Mothers should be told this and reassured that it is not a sign that the child does not want to eat. A cup and spoon should be used for feeding since they are easiest to clean. Most infants can learn to drink from a cup by 6 months of age.

Once a child is accustomed to eating (by 6 or 7 months), solid foods can begin to contribute significantly to the child's total nutrient intake. However, the amount that can be eaten at one time is limited by the child's small stomach. (A one-year-old cannot eat more than 1 to 1½ cups, or 200 to 300 ml., of food in a meal.) Therefore, the food must be a concentrated source of nutrients or must be given more frequently. It is recommended that these foods contain oil, fat, or sugar and that the child be fed a total of 4 to 6 times per day, counting both meals and snacks. To ensure that youngsters receive the food they need, their food should be separated from the family pot and served in their own bowls. Gradually, food consistency can change: at 9 months children can manage small pieces of easily chewable foods. Food quantity should also increase. By 12 months, children can eat most of the family foods. At about 18 months they should be eating half the adult quantity. This is an easy way for mothers to estimate food quantities.

Local foods can be combined to make a nutritious weaning food. Photo: Miriam Krantz

What kinds of foods are suitable for the weaning age child?

A variety of foods are suitable. The kind of food depends on what is traditionally fed to children, what food the family has available, and the amount of time the mother has to prepare weaning foods.

After the initial introduction of the weaning food, it is recommended that the food does not rely on a single ingredient. The ideal weaning food combines different types of foods and is fed to infants along with breast milk for as long as the mothers are able to breastfeed.

The first foods should be bland, not fibrous, and well-mashed or pureed. The most common first foods are fruits, vegetables, and the local staple grain or tuber. As the infant begins to eat more, a *basic mix* of two ingredients, the staple grain or tuber plus a legume (nut or bean), should be substituted for the single ingredient porridge. Porridge from the basic mix should be richer in calories and provide much more protein than the traditional porridge.

After the first six months, when solid foods begin to supply a major portion of the child's nutrients, basic mixes can be replaced by *multimixes*, one-pot foods that make a complete meal. If the ingredients are combined in suitable proportions, the multimix will supply enough calories (from carbohydrates and fats), protein, and vitamins and minerals to meet the nutrient requirements for maintenance and growth. They can be prepared from foods just for the child or from foods cooked for the family (as long as they are not spicy). Multimixes have four basic ingredients:

1. A staple, or carbohydrate food: grains (rice, wheat, corn, millet, sorghum, or oats) are recommended over roots or green bananas because their protein content is higher and their fiber content is lower.
2. A protein supplement: this can be a plant protein, such as beans, lentils, and nuts, or an animal protein, like eggs, yogurt, milk, fish and meat.
3. A vitamin and mineral supplement: the best foods are those high in vitamin A, such as dark yellow or orange squash, sweet potatoes, and deep orange or yellow fruits, like ripe papaya.
4. A calorie supplement: the addition of fat, oil, coconut milk, or sugar will make the food more "calorie dense," because these foods provide calories without adding volume.

What are other factors that determine weaning practices?

Economic, social, cultural and environmental factors all play a role in what children eat and how they will be fed.

The mother is principally responsible for feeding the child, and she is key to efforts to improve infant feeding practices. The child is dependent on her understanding of appropriate feeding practices and the limitations that prevent her from implementing appropriate feeding practices. Programs must take account of these realities:

- The mother's beliefs and practices concerning weaning. These practices will be influenced by the family, community and culture. For example, mothers living in urban areas may begin weaning earlier than mothers in rural areas, because in many urban areas there is no breastfeeding support structure.
- The mother's level of formal schooling. This factor often parallels the mother's knowledge of nutrition and has been shown to be positively correlated with her children's health status. (Mosley, 1982). The health status is likely to be better the more years of school the mother has attended.
- The role of women in the society and in the family. For example, how much voice the mother has in how the family income is spent. This will influence if income is used to purchase additional foods for the infant.
- The mother's health status. If the mother is pregnant, or ill, she may have little energy to prepare a separate weaning food, or feed her child more frequently, in addition to her other responsibilities.
- The amount of time the mother has available for food preparation. Women are usually responsible for childcare and housework. Many women also work in the fields, market or factory. The amount of time they have available will determine whether, for example, they will be willing to prepare a multi-ingredient food separately for children, and the time they can spend processing ingredients before cooking. Busy mothers often cook foods early in the morning and store it for later consumption. In hot climates particularly, bacteria in the foods multiply rapidly and cause diarrheal diseases in children.
- The availability of household resources. Lack of water, sanitary facilities and cooking utensils may also make it difficult for mothers to guarantee their children uncontaminated food. These conditions may also preclude the use of multistep cooking procedures that require processing equipment.

Other factors that influence infant feeding practices are:

- Food availability. Some foods may be available only during certain times of the year. For example, groundnuts may be available only 6 months of the year. Many of the family staples or the food available in the markets may be scarce or expensive during the time before harvest.

Food availability in the family is directly related to food production and the food marketing system of the country. Food production is influenced by climate, land tenancy system, farming methods (the types of cropping, fertilizer, and seeds), and the availability and use of agriculture extension services.

- Fuel availability. Cooking fuel (charcoal, wood, gas and kerosene) may be scarce, expensive, and time consuming to obtain. (Many of these same constraints apply to water). Infant foods that require a long cooking time, such as improved *khichuri* and *suji* mixture (from Bangladesh) that needs an hour to cook, will not become part of a daily routine.

(From: World Federation of Public Health Associations, "Program Activities for Improving Weaning Practices". pp. 5-7.)

GUIDELINES FOR WEANING

- breastfeed solely for the first 4 months.
- unless the weather is very hot, breastfed babies will not need to drink water during the first few months of life. If water is needed, feed baby boiled water with a cup and spoon.
- add (expressed) breast milk to baby's cereal and other foods to provide proteins.
- start giving semi-solid foods (e.g. porridge) at about 5 months with an emphasis on protein rich cereals.
- add easily digestible foods, (well-cooked vegetables and soft fruits) gradually -- one at a time, in small amounts.
- add protein mixes gradually. Start with a 1:4 ratio of legume:cereal; progress to 1:2 ratio of legume:cereal.
- use protein foods that are easily digested and make the best use of complementary proteins.
- after 6 months of age, weaning foods should include nutrients from the 3 food groups.
- infants' meals should not include pepper and harsh spices.
- salt and sugar should seldom be used in an infant's meals.
- pound or chop foods in advance of cooking to help ensure that baby's foods are soft and not overcooked.
- infants should be fed small meals on a frequent basis (at least 4 times a day).
- at 12 months, a child can eat a modified adult diet (i.e., adequate protein, proper consistency, no harsh spices).
- breastfeeding should be prolonged until the baby is 18 to 24 months old.
- weaning should be a slow, consistent and progressive process of increasing food types and amounts while slowly decreasing frequency of breastfeeding.
- confidence, patience and persistence is required of the mother in order to wean an infant successfully.

METHODS AND FOOD SOURCES TO IMPROVE WEANING FOODS

Type of Preparation:	*ADVANTAGES*	*DISADVANTAGES*
1. Home-prepared foods (family pot)	Cost to a family can be minimal. Have potential to affect everyday behavior with high probability that these changes will continue over time. Ingredients available locally. No new technology needed. Distribution and packaging costs nil.	May require more of women's time in processing and preparation. Require serious nutrition education effort: staff and money. Personnel must be trained in the basic messages and how to communicate them. Food quality variable. Seasonal variations may leave families with few options during some months.
2. Village/Group prepared foods	Food is made with some supervision. Quality and hygiene should be ensured. Less expensive than central processing. Better practices are learned when foods are prepared in a group situation than if centrally processed. Allow for some processing that would be too time consuming for mothers at home. Have potential to generate income. Can serve as a demonstration of benefits of new local foods. Can generate community enthusiasm and other benefits through group work on a project.	Make people dependent on purchased food and on food processing that cannot be done at home. Can be difficult to organize. Chance of long-range, home-based change, less than with a homemade food. Raw materials may be difficult to supply in a timely fashion. Require capital for "start up" costs and then maintenance costs must be met. Require small business management skills and personnel willing to stay with the project. Need a strong education and promotion effort: staff and money.
3. Foods processed at central location	Foods are made under supervision, so the nutrient content is controlled. Save time for the person preparing the food. May save fuel.	Cost of the product is high either to the government or families. Make families dependent on purchased food. Require capital investment for physical facilities for storage and processing.

Type of Preparation:	*ADVANTAGES*	*DISADVANTAGES*
	Foods unsuitable for consumption by infants without processing can be made into good, nutritious food. Can promote awareness of need for timely introduction of food. Can be stored without contamination. Easily prepared. May be the most cost efficient way for the government to provide food to those families who cannot afford more or different foods.	Requires a marketing plan to ensure that price policies, distribution networks, and promotional strategies are finely tuned. Commercial foods may not reach the target group, but only those who can afford it. Raw materials may be difficult to supply in sufficient quantity because of poor crop yields or irregular deliveries of imported foods. Packaging and distribution costs high. Changes in feeding practices made as a result of foods may not be easily sustained if foods are no longer available.
Food Sources	*Advantages*	*Disadvantages*
1. Imported foods (Donated or Purchased)	Could provide higher cost ingredients, e.g. milk powder, than consumers can afford. Help governments subsidize cost of foods for low income families.	If imported food is different from local staples it may create dependence on foods difficult to replace locally. If the food must be purchased, use valuable foreign exchange. Supplies uncertain. Require extensive storage, packaging, and distribution operation; thus government costs are high. Nutrition education efforts may not be applicable to local foods. May be a disincentive to local production or to village efforts to meet infant food problem.
2. Local foods	Call on people's creativity to utilize or produce local resources to meet a need. Effort is more likely to be sustained over time. Can have a positive economic impact in the family and community through increased agricultural production.	May require more time spent on the part of families or village to meet a local need.

(From: World Federation of Public Health Associations, "Program Activities For Improving Weaning Practices". pp. 22-23.)

THE STORY OF A BOTTLE-FED CHILD

Marangu is a village in Africa where up until recently women have been breastfeeding their young ones. Marangu is not too far from an urban center where there is a child health clinic.

Grace has lived in Marangu all her life and is married to a farmer. They have very little income and now have five children to care for. Grace's newest baby, Eli, is 5 months old. She takes him to the clinic once a month to be weighed. On her way to the clinic, she notices pictures on a big board along the road -- pictures of a happy, healthy baby boy being fed a bottle by his mother. Grace notices how happy and pretty the mother in the picture looks. Everytime she sees the pictures she thinks how wonderful it would be to be just like this woman.

Sometimes women dressed like nurses, come to the clinic to give free samples of formula. They also visit women in their homes to show them how to prepare the formula. Some of Grace's friends tell her that bottle-feeding with formula is better for babies and easier for the mother. They say breastfeeding makes your breasts droop and look ugly. The more Grace listened to their talk the more she became convinced that she should start feeding Eli with a bottle.

The next time Grace went to the clinic, she took the money she had been saving for Eli's baptism and spent it all on 5 boxes of infant formula. Eli adjusted quite easily to the bottle. Grace however had some trouble with swollen and painful breasts. But she felt so happy at first, that the painful breasts didn't bother her.

Grace couldn't read the directions on the box, so she mixed the formula with stream water until it looked "right". Eli was frequently sick with diarrhea but Grace assumed it was because he was teething and probably adjusting to the bottle.

As time went by, her supply of formula begin to run low and she began to use less and less of it, as she mixed the bottles for Eli.

Eli began to lose weight and didn't seem happy. He was constantly either sick with diarrhea or constipated. His arms and legs were swollen, and he always looked miserable. Grace was embarrased to take Eli to the clinic. She felt foolish because she was not able to feed her baby with formula that was suppose to be so simple and easy to use.

Grace decided too late that she should begin breastfeeding Eli again. She tried, but he was not able to get enough milk from her breasts. She had stopped producing milk because he wasn't sucking and now Eli was not strong enough to suck hard. Grace was miserable and Eli was close to death.

Note: Adapt the story to include the most relevant factors (e.g. poor sanitation) which contribute to malnutrition resulting from inappropriate bottle-feeding.

BREASTFEEDING AND BOTTLE-FEEDING: ADVANTAGES & DISADVANTAGES

Breastfeeding

Advantages:

- naturally suited to needs and digestion of infants
- needs no preparation, less work for mother
- ready on demand
- inexpensive
- clean
- right temperature & concentration
- contains protective elements for infant
- baby benefits from cuddling and close contact with mother
- may delay conception, (however is not reliable as a contraceptive)
- helps uterus of mother return to normal size

Disadvantages:

- severly malnourished mother who breastfeeds is depriving both herself and her child of vital nutrients.

Bottle-feeding

Advantages:

- allows mother more independence, ability to work away from home
- allows other members of family to feed child
- (N. B. these may not be advantages for the baby)

Disadvantages:

- formula is expensive
- formula needs to be accurately mixed for adequate nutrition
- takes preparation time
- formula needs to be prepared using hygiene practices
- baby is more susceptible to diseases & infections when bottles/teats/formula are contaminated
- fuel needed for heating water
- need adequate amounts of safe water to prepare formula and clean bottle
- more than one bottle and teat are needed
- need cleaning utensils and soap

THE STORY OF MAYA

Maya was born just after the first moon of the new year. Her mother, Anna, gave her the breast right away. Maya was happy, healthy and growing.

When Maya could sit by herself, Ana began to fix a liquid rice porridge for her. She gave Maya only one or two spoonfuls the first time. At first Maya just spat out most of the porridge - but her mother continued to give it to her patiently. She knew that just breastfeeding was not enough for Maya now - she needed more food. She had begun to crawl around and was very active--she needed additional food to help her grow and give her energy to play. Anna also knew that Maya must learn to eat adult foods slowly so that when she was older and stopped breastfeeding, she would not refuse the new food and grow sick. Anna knew many children who had become weak and died when they were not allowed the breast anymore.

Soon Maya was eating a small bowl of rice porridge each morning and afternoon. After Maya began to like the porridge, Anna added some mashed bannanas or pumpkin, a little at a time. Soon Maya got used to trying new foods and she liked almost everything. She was still breastfeeding but not as frequently. By the time Maya was able to stand up while holding onto something, she was eating a thicker rice porridge with pounded fish or an egg yolk. She was well and was rarely sick or unhappy. She was naughty at times. Her mother scolded her, but was very pleased that Maya was healthy and well enough to get into mischief. She was a smart little girl.

By the time Maya was almost walking by herself, she had four new teeth. She was eating almost the same things the rest of the family was eating, only it was more mashed up and less spicy. She still had breast milk at least twice a day. Anna gave Maya small meals four times a day because she knew that babies couldn't eat much at one time.

By the time Maya was walking by herself, she was eating the same foods as her family. Anna helped her eat by cutting her foods into small pieces and giving her a good piece of fish or chicken at each meal. Slowly Maya stopped taking the breast, because she was very healthy and eating all she needed.

Anna was wise to teach her child to eat adult foods slowly while still breastfeeding her. In this way Maya learned to like the taste and feel of new foods, before being deprived of breast milk. Maya continues to grow bigger, healthier and happier.

SAMPLE PROBLEMS IN INFANT FEEDING

A 9 month old child has acute diarrhea. He has been breastfed only and the mother is convinced he's not ready to eat solid foods, because she says he gets diarrhea everytime she feeds him. What would you suggest?

A year old child brought to the clinic has not gained weight since her last visit 3 months ago seems apethetic and appears to have edema. When you ask what she's being fed--the mother says, "She doesn't want to eat". What could the problem be, and how would you go about handling the situation?

You arrive at a friend's home and discover her cousin (from another village) feeding a young baby with a dirty bottle. When the subject comes up, you discover she is not breastfeeding because this is not her child. The child's mother is dead. What would you advise?

Shortly after arriving in your village you notice a child about 2 years of age sitting on the front porch of a nearby home. She is lethargic, has a swollen belly, thin limbs and conjunctivitis. When you find her parents, they say "she eats a lot". How would you go about handling this situation?

(Develop other case studies based on the nutritional problems of infants and young children in-country.)

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Session 31

PREVENTING MALNUTRITION

TOTAL TIME 3 hours

OVERVIEW

In the previous sessions, participants learned about and practiced preparing meals using locally available foodstuffs, for the purpose of promoting good nutrition. They also learned how to recognize the signs and symptoms of severe malnutrition and the importance of breastfeeding and proper weaning for infant and child health.

In this session participants examine the causes and conditions which underlie malnutrition, and use this understanding to develop specific health education plans which have for an objective the prevention of malnutrition by health workers, the family and the community. This session is closed with a discussion of or visit to a Nutrition Rehabilitation Center.

OBJECTIVES

- To recognize and describe the chain of events leading to malnutrition.
  (Steps 1, 2)
- To identify and discuss possible strategies for preventing malnutrition.
  (Step 3)
- To develop and present a health education plan that promotes good nutrition.
  (Steps 4, 5)
- To explain the basic principles and methodology of Nutrition Rehabilitation.
  (Step 7)

RESOURCES

- Helping Health Workers Learn. Chapter 25
- Nutrition Rehabilitation, Its Practical Application.

Handout:
- 25D Session Plan Worksheet
  (From Session 25)

Trainer Attachments:
- 31A Story of Ali
- 31B Case Studies

MATERIALS Newsprint, markers

PROCEDURE

Trainer Note

Participants should be asked to bring to this session information they gathered and analyzed during their information gathering visits to the community (Sessions 12 and 13) and notes from other training sessions that you think would help them identify underlying factors which may affect a child's nutritional status.

Since they will also be asked to design a health education activity, they should bring their copies of Helping Health Workers Learn to this session as it provides many helpful ideas of ways to teach and to learn about nutrition.

Step 1
(10 min)

Identifying the Conditions Which Underlie Malnutrition

Post the definition of "Causal Chain" and "Causal Web" (found in the Trainer Note below) on the wall and ask the participants to read it and discuss any questions they may have concerning these concepts.

Tell the participants that in this step you will read them a story and they should listen and identify the causes (chains and webs) of hunger and nutrition mentioned in this story.

Read the story adapted from Trainer Attachment 31A (Story of Ali).

Trainer Note

The definitions for causal chain/causal web that you should write on newsprint are:

> Causal Chain can be considered "a chain of events leading to disease or ill health". It is a micro way of viewing a health problem.
>
> Causal Web may be defined as "all the underlying factors contributing to and enhancing the disease state". It looks at a health problem from a macro perspective.

Step 2
(20 min)

Processing The Story

As a means of introducing a training activity the participants might consider using once at their work sites as well as a way to get them to think about the many related causes of hunger and nutrition, play the game called "Another One".

Tell the participants that based on what they remember from the story that you have just read you will ask them a question and they are to give an answer to that question and then "another one" and "another one". Ask for two participants to act as recorders and to write the answers given in terms of causal chains and webs and play the game.

After the participants have generated as many answers as they possibly can, draw two columns on newsprint and title one column Causal Chain and the other column Causal Web. Ask the two recorders to list the factors that were mentioned under these headings.

Have the group review this list as well as the information they obtained from previous sessions and their visits to the community and address these questions:

- What are other causes or underlying factors that have not been considered? (Please list)

- Which of the factors listed are most relevant to your programs and community? (Please circle)

Trainer Note

The list of factors related to malnutrition may include:

Chain Factor	Web Factors
● Low birth weight	● Inequitable food distribution
● Bottle feeding	● Insufficient food production
● Abrupt weaning	● Poor utilization of available food
● Parasitic infections	● Poverty
● Lack of medical care	● Infections compounding malnutrition
● Lack of sufficient protien/calories in the diet	● Inadequate medical care
● Dehydration	● Traditional beliefs/practices (e.g., food taboos)
● Diarrhea	● Population pressures
● Measles	● Poor climate for growing food
● Malaria	● Wastage due to pests
	● Low Priority of health/nutrition
	● Insufficient preservation of foods

Step 3 (20 min) Identifying Strategies for Preventing Malnutrition

Based on the list of factors the participants have identified as most relevant to their programs ask the participants to identify:

- strategies for preventing malnutrition
- realistic ways PCVs could intervene in any of these factors to prevent malnutrition
- ways you can involve mothers, local health workers, health officials, etc.

Trainer Note

You should list the answers to some of the questions on newsprint as the participants state them. In particular you should list the strategies for preventing malnutrition next to the list of causal factors. Some strategies for preventing malnutrition include:

- Nutrition education
- Promotion of breastfeeding
- Use of nutritious weaning foods as a supplement to breastfeeding
- Gardening/small animal raising
- Adequate medical care, e.g. to treat parasitic infections
- Monitoring of child growth and development
- Pre-Natal care

Step 4
(25 min)

Teaching Mothers About Child Health and Nutrition

Ask the group to count off 1, 2, 3 and to form three groups. Distribute one of the case studies from Trainer Attachment 31B to each group and ask them to develop a plan (using the planning worksheet from Session 25) for a health education session that would have an impact on preventing this situation in the future.

Trainer Note

Depending on when this session is given, more or less time will be needed for this step. If this session is held before Session 25 then you will have to briefly introduce the Session Plan Worksheet found in that session and work through one example using this worksheet. Another alternative to this step is to lengthen the time substantially and have the groups not only plan but practice the health education activity and have them present it during the Health Day (Session 17).

During this step tell the group that Chapter 25 of Helping Health Workers Learn may provide them with useful ideas and methods for teaching nutrition.

Step 5
(30 min)

Reviewing Their Plans

Ask one member from each group to present and explain in as much detail as possible their case study and the nutrition education plans they have developed for helping the community solve and or prevent this problem from reoccurring.

After each group has finished their presentation ask the group for their comments. Have the group focus on:

- The constraints they see in implementing this activity
- The cultural appropriateness of the activity
- The approach used (e.g., lecture, dialogue, discussion, participatory/experiential)
- The respect that the activity shows for people's knowledge and beliefs and practices.

Step 6 (60 min)

Nutrition Rehabilitation

Tell the group that in this step they will be visiting a Nutrition Rehabilitation Center to observe and learn:

- How they are organized (buildings, staff, equipment, supervision, record keeping).
- Types of cases they treat (severe and uncomplicated PEM cases)
- Types of subjects or topics they teach (nutrition, meal planning, health, household budgeting, gardening, home craft skills)
- The work schedule
- Follow-up practices in the home or community.

Tell them that the concepts that they derive from this visit will be useful if once at their posts the community expresses an interest in developing or improving a center where mothers take their malnourished infants to be treated.

Trainer Note

Introduce this step by telling the participants that up to now in this module we have basically been focusing our attention on how to prevent malnutrition from occurring and if severe malnutrition does occur how to recognize and treat the severe forms. Explain that another method of prevention that can be done during the early stages of malnutrition is nutrition rehabilitation. The main purpose of nutrition rehabilitation is to educate the mother through her active participation in the care and rehabilitation of her child.

If a visit to a Nutrition Rehabilitation or Mothercraft Center is not possible, you should invite the supervisor of this type of center to discuss his or her program with the group. Whichever way you choose to conduct this step, please review Joan Koppet's book Nutrition Rehabilitation for good information on planning and operating a Nutrition Rehabilitation Center.

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THE STORY OF ALI

Ali was a large healthy baby when born. His mother breastfed him whenever he gave his "hungry cry". By six months Ali had his first tooth and seemed to be growing faster than his cousin, who was born three weeks before Ali. His mother was happy. Two of her four children had died during infancy, but this time Ali looked quite healthy and happy. She was proud and content and continued to breastfeed Ali. On occasion she would give him a millet gruel. He seemed to like it, but she didn't have time to make him a separate meal each day. She had a heavy schedule already; fetching water and wood, pounding millet, working in the fields, making one pot meals over a fire, going to the market, caring for her children, sweeping sand and animals out of the house.

During the second half of Ali's first year, Ali's father died and the expenses for his funeral put the family greatly in debt. Ali's mother was forced to go to work for another family and had to leave her baby in the hands of his 9 year old sister. Ali was no longer breastfed and the only food given to him was that which was prepared for the rest of the family.

The food was spicy and Ali was not accustomed to anything but the rice. He would pick at the food but never ate much other than rice. His mother watched sadly, as he became thin and miserable. He was frequently ill and seemed to stop growing. This is what happened to her other two children. She was sure he was going to die, but accepted it as her punishment for being too proud and content with Ali when he was an infant.

CASE STUDIES

Case Study #1

Food had never been abundant in the village of Agalek, as it was close to the desert. Most of Tasha's large family had survived the last six years of drought, but all of her children were lean and didn't grow very fast. Her youngest child was born small and seemed to be a very slow learner. This year there had been enough rain and the wheat crop was good. Tasha's husband sold two-thirds of the crop in order to get money to pay off some of their debts. Besides, they didn't have enough place to store that much grain. At the time it seemed more important to sell the wheat than save it, because other food was available. It was the season of fruits and vegetables and the children were always eating mangoes or tomatoes. However, times got harsh again. Their wheat supply also ran very low rapidly because much of the stored grain was damaged by insects and rats. Tasha's husband went into debt again to buy what little food was available to keep the family alive.

Case Study #2

Kiku was a healthy baby. At 18 months she was still being breastfed and receiving some supplementary food on occasion. At times, Kiku's mother (Aru) attended a clinic where Kiku was weighed and Aru given a soybean meal to prepare at home for Kiku. When Kiku became sick with a cold and diarrhea, Aru immediately stopped feeding her believing that food made the diarrhea worse. At first Aru did not take Kiku to the clinic because it did not seem necessary, she would get better. But then Kiku became worse - she developed a heavy cough and fever and was very weak from the illness and lack of food. By now Aru was too ashamed of her condition to take her to the clinic. She decided to go to a traditional healer instead.

Case Study #3

Jose was 2 1/2 years old when he returned from the hospital 40 miles away. He had suffered from a severe case of protein deficiency and stayed at the hospital for two months getting treatment. He was now at a weight appropriate to his age and in fairly good health, so he was allowed to go home. His family was happy to have him back home. His younger sister was now 10 months old and beginning to eat some of the family food too. Jose quickly went back to eating the familiar pattern - yams one day, rice the next. He was also back to the familiar environment with the pigs and goats wandering around the yard. It became his job to chase them away from the cooking area. Jose soon had worms again, like all the other children. His belly was bloated and hard, he was either constipated or had diarrhea and frequently his mother saw worms in his poop. She didn't know where they came from or what damage they did to her son. After a few months, Jose began to show the signs of Kwashiorkor again - puffy looking ankles and hands, thin upper arms and he was always miserable and not hungry. His parents didn't know what to do - they couldn't afford to send him back to the hospital. Besides it didn't seem to cure him - since the "disease" came back so fast.

Module 6

Maternal and Child Health

Behavioral Objectives

By the end of this module, participants will be able to:

1. List three signs of pregnancy.

2. State three things that pregnant women should do during the course of their pregnancy.

3. Identify four signs that indicate high-risk pregnancy.

4. Describe five signs of healthy development of children aged up to two years and state the ages a child usually exhibits these signs.

5. Explain the use, side effects and effectiveness of five methods of contraception.

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Session 32

NORMAL PREGNANCY AND PRENATAL CARE

TOTAL TIME 3 hours

OVERVIEW

"A healthy baby begins with you" is the most important health message for pregnant women. This session therefore focuses on ways to help women protect their own and their unborn child's health during pregnany.

In this session, participants learn the signs of pregnancy and how to sensitively discuss the topic with villagers. They learn how to do basic prenatal counselling in nutrition, self-care and management of routine pregnancy complaints and how to help monitor normal pregnancy progress to recognize when to refer a pregnant woman for medical attention. Through peer teaching with visual aids, role play, and practicing of counselling skills, participants gain skills and sensitivity in working with pregnant women in the village setting.

OBJECTIVES

- To recognize signs and symptoms of pregnancy and to describe the diagnosis of pregnancy. (Steps 1, 2)
- To describe normal progress in pregnancy. (Step 3)
- To demonstrate and practice prenatal counselling in self-care, nutrition and management of routine pregnancy complaints in the village. (Step 5)

RESOURCES

- Helping Health Workers Learn. Chapters 21 and 22.
- Where There Is No Doctor. Chapter 19

Trainer Attachments:
- 32A Role Play On Pregnancy
- 32B The Normal Progression Of Pregnancy
- 32C Prenatal Counselling
- 32D Normal Delivery
- 32E Five Essential Steps To Follow During The Baby's Birth

MATERIALS

Props for drama or role play, newsprint, markers, visual aids or films on pregnancy and normal delivery, birthing kit.

Trainer Note

A nurse-midwife and/or traditional birth attendant should be invited to assist during the presentation of this session. The presence of trained health personnel is extremely important not only for presenting the technical aspects of labor and delivery (Step 5) but also for talking about the local traditions and beliefs toward pregnancy and delivery of the child. Ask them to bring slides or other visual aids and their birthing kit. Tell them, if possible, a simulation/demonstration of the activities they carry out during and after the birthing process would be appreciated. If at all possible, a visit to a clinic or hospital to see a live birth should be arranged.

Prior to this session ask a participant to prepare a presentation using visual aids and Trainer Attachment 32B to explain the nomral progression of pregnancy.

Also, in advance of this session, ask four participants who are particularly knowledgeable or interested in maternal and child health to prepare a demonstration on prenatal counselling to be given in Step 4. They should include all the information found in Trainer Attachment 32C (Prenatal Counselling) and information in Helping Health Workers Learn (Chapters 21 and 22) and Where There Is No Doctor (Chapter 19).

Be sure to assist these participants before the session in the development and use of appropriate visual aids for their presentation, and help them model effective ways of sharing this information at the village level.

Step 1
(35 min)

Recognizing The Signs of Pregnancy

Review the objectives and give a brief introduction to this session.

Next ask for six volunteers to be role players. Ask them to team up in pairs and distribute the role sheets (Trainer Attachment 32A) to each pair. While they are preparing for their parts ask the rest of the group to help you arrange the physical setting for the role play. Tell the role players they have 20 minutes to prepare for their role play.

Describe the setting for the role play (see Trainer Attachment 32A) and ask the role players to begin.

Trainer Note

Tell the participants who have volunteered for the role play that they should try to incorporate as much of what they know about the local culture and organization of health centers into their roles as possible. They can refer back to what they learned in Session 6 (Health Care Delivery Systems) as well as Sessions 10-13 on Community Analysis. If possible, the participants who play the "nurses" should have some knowledge of the signs and symptoms of pregnancy. The roles of the pregnant women in the first and third scenes should be actual pregnant women from the community if possible.

Step 2
(15 min)

Processing The Role Play

After the role play facilitate a discussion focussing on:

- What signs or symptoms mentioned indicated pregnancy? (Generate from the group all the signs discussed in the role plays: add any additional signs that should be included; record on newsprint.)
- What relevant questions did the nurse ask about the present or past pregnancies?
- Why do you think these were important?
- What should the nurse have asked or done but didn't?
- In each case, how could the interaction and the interview process have been improved?
- What do local people identify as signs and symptoms of pregnancy? What terms do they use.
- Any further questions, comments, suggestions?

Trainer Note

Responses concerning the signs and symptoms of pregnancy may include such things as:

- laboratory test confirmation
- enlarged and/or tender breasts
- darkened nipples
- "morning sickness"
- weight gain and abdominal distention
- local spiritual or traditional beliefs such as positive or negative changes in the woman's complexion or hair texture or different responses to the woman from animals or children, changes in the woman's appetite or food preferences, etc.

Step 3
(20 min)

Discussing The Normal Progression of Pregnancy

Ask the preselected participant to give his or her presentation on the normal progression of pregnancy (Trainer Attachment 32B).

Based on this presentation and other information the group has acquired to date, have them discuss the importance of an early and accurate diagnosis of pregnancy. Items for discussion should include:

- The effects of the pregnant woman's health on the newborn (i.e. malaria, overwork)
- The need for vaccinations to prevent tetanus in the newborn
- The importance of monitoring fetal development
- The need to eat for two.

Trainer Note

The person giving the presentation should be encouraged to use visual aids and to emphasize the need for continued monitoring of the pregnancy.

The discussion in this step should focus on normal pregnancies. Discussion of high-risk and problem pregnancies should be held for Session 33.

15 Minute Break

Step 4
(30 min)

Prenatal Counselling

Have the participants who have been asked to facilitate this step present their counselling session.

At the end of their demonstration have the participants discuss and list on newsprint, what they observed and learned concerning:

- the minor symptoms of pregnancy (nausea, vomiting, dizziness, discomfort)
- ways to treat these minor symptoms
- nutritional needs during pregnancy
- general hygiene practices
- normal physical changes a pregnant woman should experience
- general stages of fetal development during gestation
- local attitudes toward sexuality and pregnancy
- what the volunteer needs to know to feel competent when discussing these topics with pregnant women
- Other questions, concerns, comments.

Step 5
(30 min)

Normal Delivery

Introduce the nurse-midwife or traditional birth attendant who has been invited to discuss and demonstrate, the stages of labor, and the birthing process using pictures, slides or simulations.

Afterwards facilitate a discussion on:

- the labor symptoms
- The stages of delivery
- The various positions a woman can take during delivery
- The role of the midwife or TBA during and after delivery
- The equipment needed and used during this process
- Your emotions and concerns for the mother and child while viewing the process.

Trainer Note

If possible the participants should visit a clinic or hospital where they can witness a real delivery.

Trainer Attachment 32D (Labor and Delivery) and Where There Is No Doctor, pp. 259-262 should be reviewed by you and if any of the points covered have not been mentioned or discussed please mention them at this time.

Step 6
(35 min)

The Birth and Care of the Newborn

Ask the participants to briefly summarize the steps to take to insure a normal and healthy pregnancy and delivery.

After they have listed what they recall from the previous steps, you or the midwife should conclude this session by discussing and demonstrating the five essential steps to follow during the baby's birth and the essential care given to the newborn (Trainer Attachment 32E).

Conclude by asking the participants and guests to discuss what roles PCV's can play in providing prenatal care and what further information they need to feel comfortable to be effective in this role.

Trainer Note

Review pages 262-265 for information on the care to be given to the baby and mother immediately after birth.

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ROLE PLAY ON PREGNANCY

Role Play:

The scene should take place in a two room building, with a nurse interviewing and weighing women in one room and another nurse doing prenatal examinations in the other room. The three women who will be interviewed are coming to the clinic for the first time and are a bit fearful and hesitant. The rest of you are all women waiting to see a nurse. You have been waiting all morning in the first room where the nurse conducts interviews. The nurses have already been working 4 hours and as you know, there are still many women waiting.

Depending on the cultural setting and norms regarding pregnancy in the host country (whether inquiries about pregnancy would be explicit or covert), ask the participants to adapt the attached three role play situations. The three women's responses should reflect their state of pregnancy:

- First Woman:	about 2 months pregnant
- Second Woman:	not pregnant, but has some questionable signs
- Third Woman:	obviously pregnant, with a history of prior complications

Dialogue #1

(Between a nurse and woman who is 2 months pregnant)

Nurse: Good Morning. How are you today?

Woman: I feel fine - a little tired, my mother thinks I am pregnant.

Nurse: Have you been pregnant before?

Woman: No.

Nurse: Have you noticed any change in your bleeding cycle?

Woman: Yes it has not come for 2 months.

Nurse: Have you felt sick during this time? Has your stomach been upset?

Woman: Yes, in the last month I have felt sick every morning. I can not eat much. Sometimes when I eat, the food comes back up. But I usually feel better later in the day.

Nurse: Have you seen any changes in your body?

Woman: My breasts are bigger and they feel soft.

Nurse: Are you eating well during the day?

Woman: Since I feel sick much of the morning, I am not hungry. Sometimes I eat in late afternoon.

Nurse: I too think you may be pregnant. Let's go in here, where I will examine you and tell you some good foods to eat in the morning so you will not feel so sick. I will also explain why it is important to eat well to help yourself and the baby be strong.

Dialogue #2

(Between a nurse and woman who is probably not pregnant)

Nurse: Good Morning. How are you today?

Woman: Very tired and worried. I am afraid I am pregnant again.

Nurse: Have you missed your monthly bleeding?

Woman: Yes - It did not come last month - my belly hurts and I'm always tired.

Nurse: How many children do you have?

Woman: I have had eight children, five are still living.

Nurse: How are your children?

Woman: They are troublesome and I worry about them. I don't want to have another baby.

Nurse: Are you eating well?

Woman: I do not feel like eating. I am so worried about my children.

Nurse: Has your stomach been upset?

Woman: No, but sometimes I feel so hot, like I have a fever.

Nurse: Have you been using anything to stop you from becoming pregnant again?

Woman: Yes, I take the pills I buy at the pharmacy every month.

Nurse: Do you take them every day.

Woman: Yes, but I am not sure they are working.

Nurse: I am not sure that you are pregnant. You may just have some signs because you are too worried. After I examine you, I will send you to the doctor - he will be able to tell if you have a sickness, and he will have tests taken to see if you are really pregnant.

Dialogue #3

(Between nurse and woman who is about 6 months pregnant)

Nurse: Good Morning. Sit down please. I am going to ask you some questions so we will know you better and help you have a healthy baby. How are you feeling today?

Woman: I feel good.

Nurse: Can you remember when it was you last bled?

Woman: Oh, it was at the start of rice harvest.

Nurse: So you are porbably in your 6th month now. Have you felt movement in your belly?

Woman: Some movement at night.

Nurse: Have you been feeling good since you started to carry this baby?

Woman: Yes, I have not been sick at all.

Nurse: How may children do you have at home?

Woman: Four children, one is my sister's child.

Nurse: How many times have you had a child in your belly before this time?

Woman: Six times, two babies died before they were born and my first baby - a girl - died of the fever before she could talk.

Nurse: Who delivered your children?

Woman: Old lady "Nana" in my village delivered all my children, but she died last year. So I came to the clinic.

Nurse: It is good you came to the clinic. I am going to examine you now and I want you to tell me as much as you remember about your last pregnancies, what foods you are used to eating, and other things I need to know to help you deliver a healthy baby.

THE NORMAL PROGRESSION OF PREGNANCY

Introduction:

It is important for participants to recognize conditions and changes that occur during normal pregnancies, primarily so they will be able to recognize marked deviations from these normal events as potentially high-risk situations which require medical intervention. The goal of this lecturette, therefore is to enable participants to recognize signs and symptoms of pregnancy and to recognize and describe accurately the progression of a normal pregnancy.

The attached information may most helpfully be presented as a dialogue of questions and discussion points including:

- the identification of signs and symptoms of pregnancy
- description of normal weight gain during pregnancy and the implications of more or less weight gain for maternal and fetal health (i.e.: much less may cause a very premature and unhealthy newborn, and much more may suggest underlying disease, such as diabetes in the mother, and also cause an unhealthy newborn and difficult delivery)
- description of the normal physical changes a pregnant woman should experience during pregnancy
- description of the general stages of fetal development during gestation

Drawings which illustrate the different stages of pregnancy (both of maternal and fetal growth and change) should be used for this presentation as well as graphs which indicate a normal weight gain, wall-charts and any other posters which illustrate maternal and fetal growth.

1. Changes During Pregnancy – The Uterus

The most obvious change observed in the woman's body during pregnancy is the increasing size of the abdomen caused by the enlarging uterus. Over the 40 weeks of pregnancy, the weight of the uterus increases from 50 to 60 g to 1000 g. Its capacity increases from 2 to 10 ml to a size large enough to contain a full-term fetus and a liter of amniotic fluid.

The uterus of the nonpregnant woman is a small, pear-shaped muscular organ. It lies in the pelvis, between the bladder and rectum. In the first weeks of pregnancy, the uterus enlarges gradually and begins to exert pressure on the surrounding pelvic organs. During this time, women frequently complain that they have to urinate often.

By the end of the 3rd month (or 12th week), the growing uterus has become nearly round in shape. It has become too large to remain totally in the pelvic cavity. The examiner can feel it in the abdomen as a firm, spherical muscle just above the pubic bone. As the uterus rises out of the pelvis, pressure on the bladder is somewhat relieved. At this stage, the fetus is 6-7 cm long.

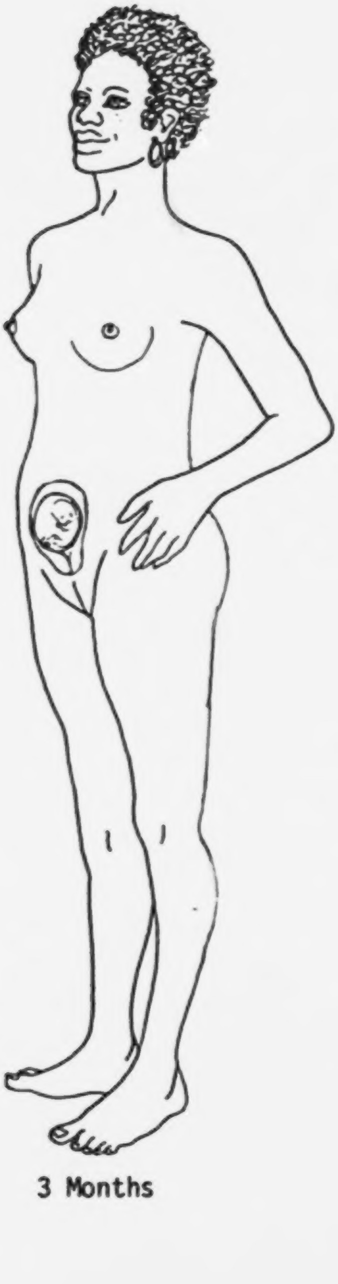
By the 5th to 6th month, the uterus has risen to the level of the umbilicus and has become oval. It sometimes leans or rotates toward the right. The fetus now is 25 to 30 cm long.

During the later months of pregnancy, the enlarging uterus displaces the stomach and intestines and causes the diaphragm to rise. Pressure on the stomach and intestines may slow intestinal action and the emptying time of the stomach. This leads to complaints of indigestion, constipation, and gas pains.

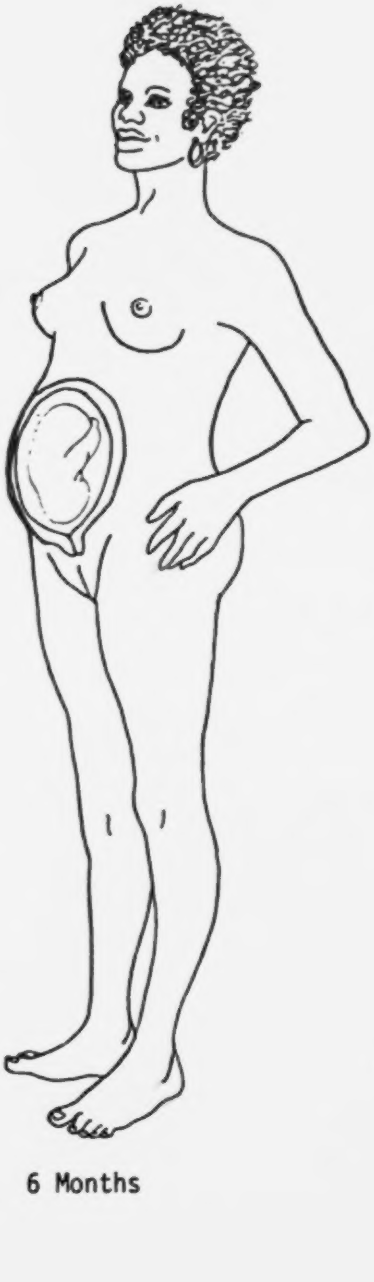
By the 9th month the growing uterus reaches the lower tip of the sternum. In a woman pregnant for the first time the fetal head settles into the pelvis about two weeks before delivery. The uterus drops to the level it had reached at 8 or 8½ months. In a woman who has delivered previously, this may not occur until labor begins.

In a normal pregnancy, the growth of the uterus is predictable, constant, and steady. Failure of the uterus to grow steadily might indicate that the fetus is dead. A uterus that is larger than would be expected for that stage of pregnancy or one that is growing more rapidly than usual may be due to the presence of more than one fetus. It may also be caused by such problems as abnormal growths or an excessive amount of amniotic fluid.

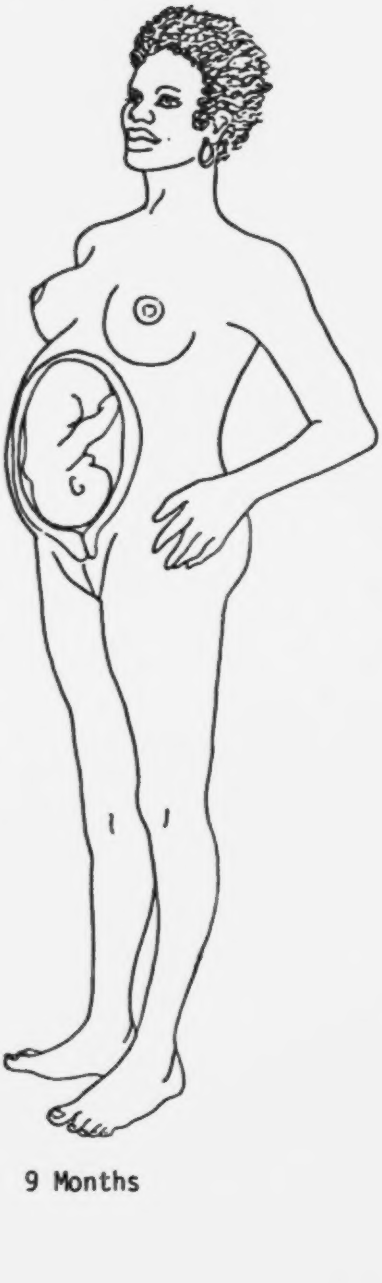
The nurse or midwife should closely monitor the growth of the uterus. If the increase in size of the uterus appears to be abnormal, the woman should be referred to an appropriate medical facility.



3 Months



6 Months



9 Months

Changes During Pregnancy–Breasts and Skin

Breasts

Changes in the breasts appear early due to increased amounts of maternal hormones. Usually, the woman first notices fullness, tenderness, and tingling in the breasts. Then, by the 2nd month, the breasts become larger. As more blood is needed, small veins increase in size and become more visible.

The nipples become more erect and darker. The areola, the pigmented area around the nipple, becomes darker and larger. The changes depend on the normal color of the woman's skin. The areola becomes dark brown to black in pregnant women with dark hair or skin, dark pink in women with fair hair or skin.

In some women, an area of splotchy color, referred to as a secondary areola, extends beyond the areola; sometimes it covers almost half the breast. This color may remain as long as a year after delivery, but in most cases it eventually fades.

Certain glands of the areola, called Montgomery's tubercles, also enlarge. They appear as small nodules. These glands produce a substance that keeps the nipples soft.

As early as the 4th month a thin, pale yellow fluid called colostrum may be expressed from the breasts.

Chloasma, or Mask of Pregnancy

Changes in the amounts of certain hormones cause increased pigmentation, or color, of the skin during pregnancy. On the face, irregular brownish patches may appear around the eyes and over the cheekbones. This is called chloasma, or the "mask of pregnancy." It occurs to some extent in most women and sometimes is very noticeable from about the end of the 2nd month until delivery. If the woman is upset by the coloration, she can be reassured that it usually disappears after the baby is born.

Linea Nigra

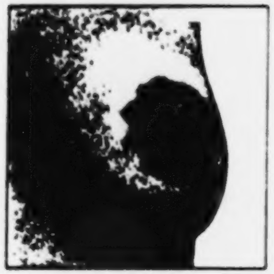
Increased pigmentation is also seen on the abdomen. A brown line (linea nigra) goes down the center of the abdomen from the umbilicus to the pubic bone. It becomes progressively paler after delivery.

Striae Gravidarum

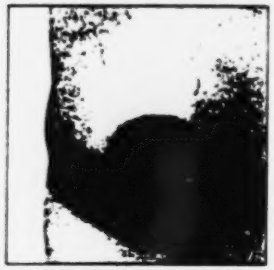
Tiny scars or stretch marks may appear on the abdomen as early as 16 weeks. About half of all pregnant women have some of these marks by the later months of pregnancy. They appear less frequently on the breasts and thighs.

These lines, called striae gravidarum, are due to stretching of skin that has been softened by maternal hormones. When fibers in the deeper layers of the skin separate, bluish pink or purple streaks appear on the skin surface. After delivery the marks remain but fade to a silvery white color that is less noticeable.

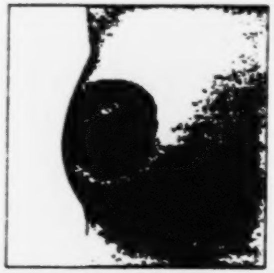
Changes During Pregnancy: Breasts and Skin



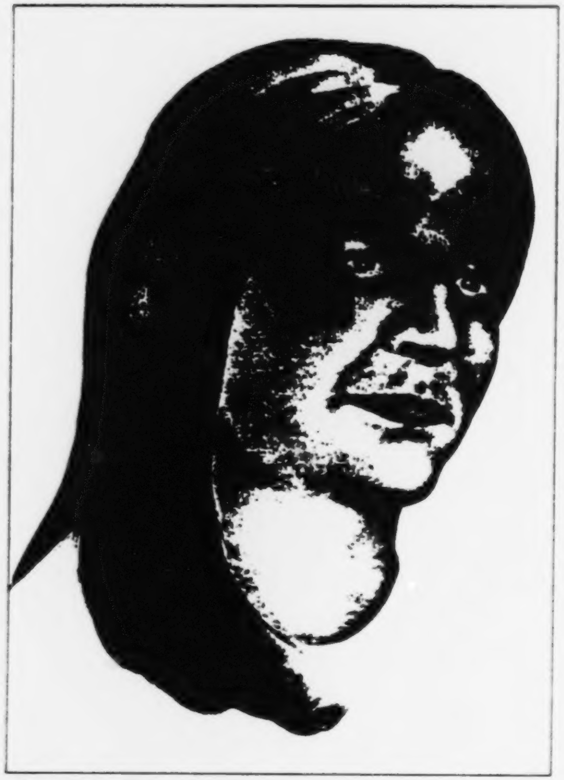
1. Secondary Areolae



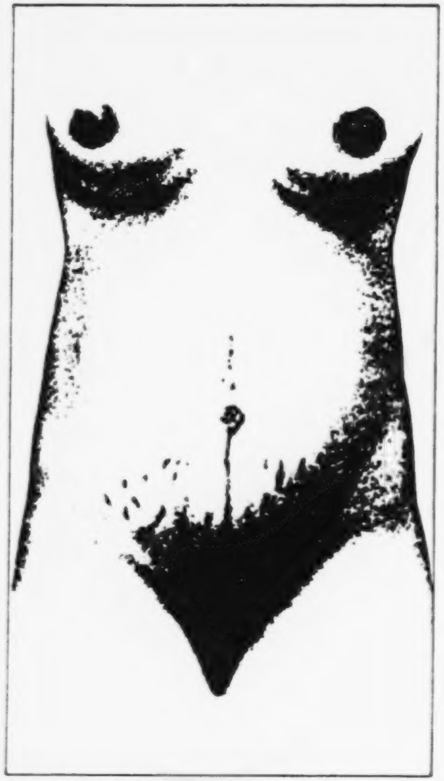
2. Blue Veins



3. Montgomery's Glands



4. Chloasma



5. Linea Nigra and Striae Gravidarum

Common Fetal Positions and Presentations

A safe delivery depends upon the adequacy of the maternal pelvis, the size and position of the fetus and the forces of uterine contraction. If the woman has safely delivered one or more full-term infants vaginally, her pelvis probably is adequate in size and shape. Delivery could be a problem, especially in a first pregnancy, if the woman is young (under 15 years), very short or has skeletal deformities. Any woman who has had previous difficult deliveries, cesarean sections, or stillbirths should be referred to a physician.

The posture of the baby's body and its position in relation to the mother's pelvis also is important. The fetus needs to be in a position that allows it to flex, extend and rotate as it goes through the pelvis. At all times, the longest diameter of the fetal head must be in the same direction as the greatest diameter of the pelvis.

Posture

Normally the fetus is curled up in the uterus. The back is flexed, and the chin touches the chest. The legs are drawn up, with the knees bent. The arms are at the sides or crossed over the chest. The buttocks are in the top of the uterus, whereas the head is down with the top portion of the back of the head closest to the cervix. In this posture and position the fetus fits neatly in the uterus and occupies the least space. It is in the best position to enter and pass through the pelvis. The baby's position in relation to the mother's pelvis is described in terms of its lie, presentation, and position.

Lie

Normally the long axis (the length) of the fetus' body lies in the same direction as the mother's, with the fetal head in either the top or bottom of the uterus. This is called a *longitudinal lie.* It occurs more than 99% of the time. Occasionally, the fetus may be lying *transverse* with the head and buttocks in opposite sides of the uterus rather than in the top or bottom.

Presentation or Presenting Part

The presenting part is the part of the fetus' body that is in position to enter the birth canal first. It is the part felt upon a vaginal exam as the cervix dilates.

In a longitudinal lie, either the head or buttocks is the presenting part. If the head is presenting, it is a *cephalic presentation.* If any part of the buttocks is presenting it is called a *breech presentation.*

In a transverse lie, the shoulder is the presenting part. This is an obstetric emergency; it is impossible for a fetus at or near term to enter and pass through the pelvis in this position. Any pregnant woman suspected of having a transverse lie should be referred to a hospital for delivery.

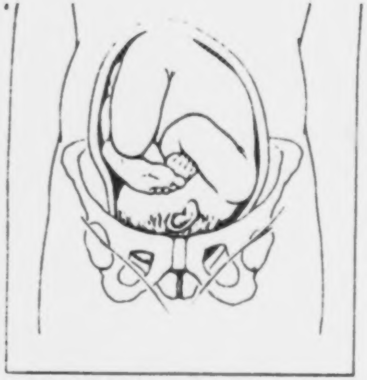
Position

Position is the relationship between a specific portion of the presenting part and the mother's pelvis. The portions of the presenting parts commonly used as points of reference are: the occiput in a vertex presentation; the chin (mentum) in a face presentation; the sacrum in all breech presentations; and the scapula in a shoulder presentation. The presenting portion is directed toward either the front (anterior), back (posterior), or side (transverse) of either the left or right of the mother's pelvis. Positions are frequently abbreviated using three initials. The most frequently occurring position is left occipital transverse (LOT). In this position the occiput is directed toward the left side of the mother's pelvis. Other common and preferable positions are left occipital anterior (LOA) and right occipital anterior (ROA). In these positions, the occiput is directed toward either the left or right front of the mother's pelvis.

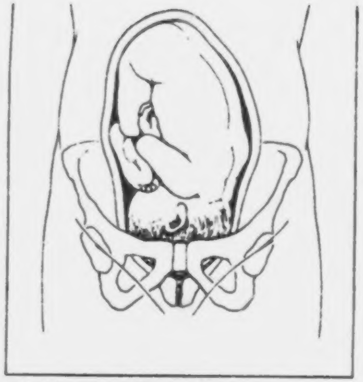
In left or right posterior occipital positions, the back of the fetal skull is directed toward the mother's back. Fetuses in these positions frequently rotate during labor so they deliver in an anterior position. Fetuses may be delivered in a posterior position. However, labor usually is longer and the woman has more discomfort from back pain.

Rarely, when the head is the presenting part, it is not flexed (with chin on chest). In these cases the presenting part will be the brow or face. Most of these fetuses can be delivered vaginally, but labor is prolonged, the woman suffers more pain, and the perineum is more likely to be torn during delivery. The infant will have a bruised face and will need to be observed closely for respiratory difficulties. Such deliveries should take place in a hospital.

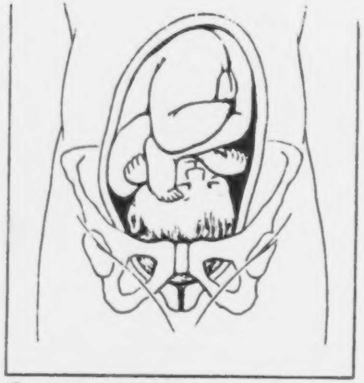
In breech presentations the lie is longitudinal but the head is in the fundus. Breech presentations occur in 3% to 4% of cases. Most often, the buttocks are presenting, the hips are flexed, and the legs are extended against the body, with the feet touching the face (frank breech). Sometimes the buttocks are presenting and the thighs and legs are flexed in a squatting position (complete breech). Other variations are with one or both feet or knees presenting (footling breech). All breech presentations should be delivered in a hospital.



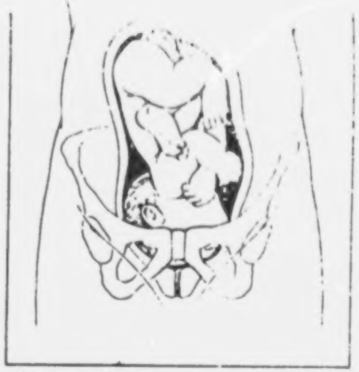
1. Left Occiput Transverse



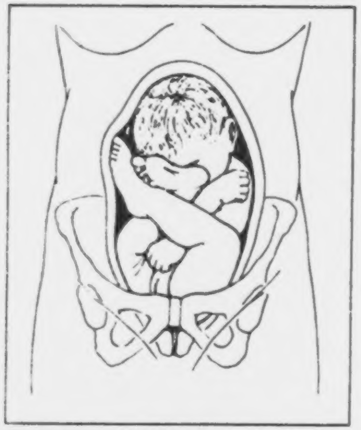
2. Left Occiput Anterior



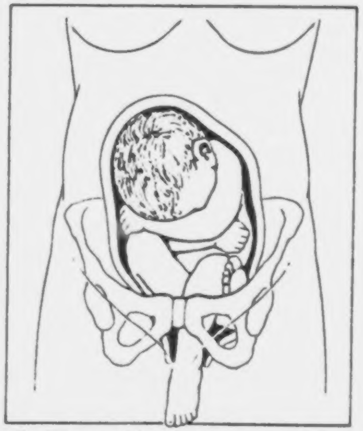
3. Right Occiput Posterior



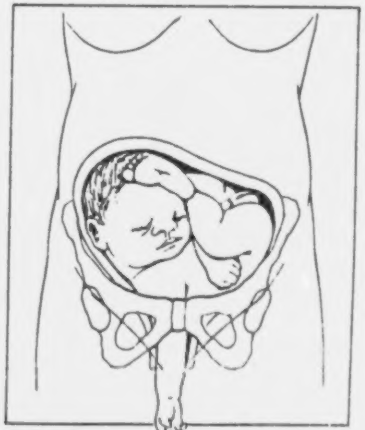
4. Left Mentoanterior



5 Frank Breech



6 Footling Breech



7 Transverse

(From: Ross Laboratories)

PRENATAL COUNSELLING

Situation:

The scene should one in which a recently married young woman is being "watched"/probed for "proof of her fertility" and signs of pregnancy (especially by her husband's female relatives). She isn't sure if she is pregnant or not, but hasn't been feeling well lately. She also does not know what, if any thing, she needs to do if she is pregnant

Depending on the cultural setting and normative behavior regarding pregnancy in your country (whether inquiries about pregnancy would be explicit or covert), adapt and create the role play with the following characters:

- Pregnant and recently married young woman
- Older women in village (perhaps TBA and/or husband's relatives)--giving advice and asking leading questions)
- Female or Male PCV
- Health Worker (Optional)

If women usually bathe or gather to wash clothing at a stream, river or public tap, this may be the appropriate and typical scene for exchange of personal information. If another setting is more appropriate in your country, adapt the role play accordingly.

The questions which should be asked in preparation for and after this step are:

- How can the PCV provide useful advice to pregnant women? What is the most effective and likely forum to share this advice in?

- How is the PCV likely to learn about a woman's pregnancy and can the PCV (male and/or female) appropriately offer advice?

- Will the PCVs advice be well-received and what can the PCV do to make the advice more appropriate and acceptable?

- How should the PCV deal with bad advice given to a woman from a traditional healer or others in the village?

The advice that should be offered during this counselling session should include information found in the following pages of this attachment.

MATERNAL AND CHILD HEALTH

In many developing countries a large proportion of children die before they reach school age, and many of those who survive are stunted by malnutrition and repeated infections. Not only does the largest proportion of death and disease occur in childhood in these areas, but an even larger proportion of the disease-preventive potential is duri g this period. Most prevention must be early in life to be effective. This preventive effort should begin with the care of pregnancy.

Diet and Nutrition During Pregnancy and Lactation

In nearly all communities, the mother is chiefly responsible for care within the family of infants and dependent children, and poor maternal nutritional status may have serious consequences for such children. The nutritional needs of the woman who is pregnant or breast-feeding are greater than at any other time in her life.

From the nutritional viewpoint, the mother's diet should provide sufficient nutrients required to maintain her and her fetus (unborn baby) in good health during pregnancy. An adequate diet provides for the physical strength necessary during labor and delivery. After birth, a good diet continues to support an adequate flow of breast milk without danger to maternal reserves of various nutrients. And, finally, good nutritional habits are necessary to maintain the health of the mother between pregnancies.

Effects of Inadequate Diet for the Pregnant Woman

1. The lack of protein could cause brain damage to the child.

2. The lack of Vitamin A could lead to visual problems for the child.

3. The unborn child will take some nutrients from the mother which could leave her in poor health.

    a. The mother's teeth and bones will lose their hardness because the baby takes calcium needed for his/her bones and teeth.

    b. If the mother does not eat enough body-building foods, she may not be able to produce enough breast milk for her child.

    c. The mother may become anemic if the storage of iron in her body is low. The baby will take the iron he/she needs from her.

4. Iron deficiency in the mother before birth can lessen the baby's supply of iron after birth so that he or she may become anemic. If the infant has an adequate store of iron built up while inside the mother, breast milk serves as an adequate diet during the first four months. Breast milk does not supply iron, however, and therefore the infant will need iron-containing foods added to his or her diet after four months of life. The infant will need iron added to his diet during the first four months if the mother did not have enough in her diet during pregnancy.

5. Abortion, miscarriage and still-birth occur more often in poorly nourished women. Nutritional deficiencies increase the chance that the baby will be malformed; generally poor diets of mothers may cause babies to be born undersized.

Care of the Pregnant Woman Before Birth

Many complications and deaths of mothers and infants can be prevented. Every pregnant mother can protect herself by attending a clinic for pregnant women, every month at first, and then every week during the eigth month when complications are most likely to occur.

Important Activities for Care of the Pregnant Woman

1. Insure good health of the mother by treating any illnesses and offering advice for any disorders.
2. Promote adequate rest and avoidance of exhausting work.
3. Immunize her against tetanus.
4. Assure her adequate food, with vitamins and iron, if needed.
5. Provide education in health, nutrition, and hygiene for herself, her unborn child and any other children she may have at home.
6. Watch for the woman who has a good chance of complications so that she will give birth in the hospital.
    a. Age: If she is (1) under 16, (2) over 40, or (3) over 35 and pregnant for the first time.

    b. History of complicated pregnancies.
        - Caesarian section or history of long, difficult labor
        - Miscarriage, abortions, still-births
        - Difficulty becoming pregnant

c. If under five feet tall

d. If the baby is in an abnormal position within the mother

e. High blood pressure

f. Heart trouble or diabetes

g. Mental illness

h. Syphilis, tuberculosis or other infections

i. More than 4 to 6 pregnancies

j. Pregnancies too close together (less than two years between)

Sometimes, unexpected difficulties occur in an apparently normal case, so all women should know the following danger signs and come to the clinic or see a doctor when they appear.

Danger signs of Pregnancy

- scanty urination or a burning feeling when passing urine;
- sores or rashes of any kind;
- severe pain in the abdomen;
- chills and fevers;
- nausea and vomiting after the fifth month of pregnancy;
- vaginal bleeding or discharge;
- swelling of face, hands, or feet;
- persistent headache or dizziness;
- blurred vision;
- fits or convulsions.

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All women during their pregnancy will exprience some minor discomfort from time to time. Some common complaints and relief measures are:

1. Morning Sickness: nausea and vomiting during first few months.
    a. Eat small portions of energy foods between meals (dry bread, biscuit, cassava, peanuts).
    b. Eat two or three crackers or piece of dry bread immediately upon waking.
    c. Lie quietly for 20-30 minutes after waking.
    d. Dress slowly.
    e. In due time, eat regular breakfast.
    f. Avoid eating foods that do not digest easily (e.g. fats, oils).
    g. Eat a little at a time a number of times during the day--(not 1 or 2 big meals).
    h. Avoid foods with strong odor, extremes of temperature, and take liquids and solid foods separately.
    i. Rest after meals by sitting upright.
2. Heartburn: a burning feeling in the lower chest due to irritation caused by gastric juice going into the esophagus (tube taking food to the stomach).
    a. Avoid highly seasoned foods, pepper and oil.
    b. Use an extra pillow when sleeping.
    c. Eat small amounts frequently during the day and a little before sleeping.
    d. If all fails, take a small amount of antacid (e.g., Milk of Magnesia).
3. Constipation: difficult incomplete or infrequent movement of the bowels.
    a. Eat plenty of fruits (oranges, papaya, bananas, etc.) and raw vegetables (e.g. carrots, if available).
    b. Drink plenty of water.
    c. Eat plenty of whole grains like cereals, rice, wheat.
    d. Exercise daily (when possible).
4. Varicose Veins: abnormally swollen or dilated veins of the leg caused by lack of muscle tone and increased pressure during pregnancy.
    a. Do not stand up for too long a time.
    b. Extend and elevate legs whenever possible.
    c. If the condition is severe, rest in bed often and wrap leg comfortably in an elastic bandage (if available) before getting out of bed (do not restrict the circulation of blood).
    d. Extend and elevate legs whenever possible.

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5. Backache: may be caused by the growing uterus and relaxation of pelvic joints, or may be due to poor posture. Backache is also an early sign of labor.

   a. Get sufficient rest.
   b. Maintain good posture when standing.
   c. Wear low-heeled shoes.
   d. Sleep on a firm bed--it may be necessary to put planks under the matress.
   e. Squat, rather than bend, when attempting to pick something up.
   f. If the backache is severe, see a doctor.

A good exercise to teach mothers for the relief of lower back pain is the "pelvic rock". Be sure to demonstrate the exercise first before asking mothers to do it.

1. Lie on back with knees bent.

2. "Rock" away hollow in back, tightening abdomen.

3. Relax, arching back.

(May be done on all fours.)

(Adapted From: Handbook for Health Personnel in Rural Liberia.
Hansen, King, and Lee, Preparation for Child Birth.
Community Health Education in Developing Countries.)

Session 32, Trainer Attachment 32D
Page 1 of 2

The Normal Delivery

After the cervix is completely dilated, the baby descends through the mother's pelvis and is born. This process takes 15 to 30 minutes in a woman who has previously delivered and as much as an hour or more in a woman who is delivering for the first time.

The only certain method of determining when the cervix is fully dilated is by doing a vaginal exam. Vaginal exams should never be done unless sterile gloves are used. Even under sterile conditions the chances for infection are increased when a vaginal exam is done. Therefore, the midwife should be able to recognize other signs that the cervix is dilated. These signs include the following:

- An increase in bloody show
- Rupture of the membranes after several hours of labor
- Involuntary bearing down
- Increased pressure on the rectum and protrusion (pushing out) of the anus
- Bulging of the perineum

The delivery of a baby is a normal physiologic process and most women will deliver spontaneously if left alone. The midwife's chief responsibilities are to anticipate and recognize problems and take precautions to make the birth safer. During this stage her functions include:

- Preventing infection
- Protecting the mother's perineum from tearing by encouraging the slow delivery of the head
- Preventing cord complications
- Clearing the baby's airway
- Assisting with delivery of the shoulder

Preventing Infection

Infection threatens the mother and infant. This is one problem the midwife can do much to prevent. The midwife should be sure the place where delivery will occur is as clean and private as possible. All linens should be freshly laundered. All equipment such as scissors, basins, clamps, and cord ties must be boiled for 20 minutes after the water bubbles and then kept covered.

The woman should be bathed if possible. As delivery draws near, the woman's pubic area, thighs and buttocks are washed with soap, water, and an antiseptic solution, if available. The midwife should wear sterile gloves. If sterile gloves are not available the midwife should wash her hands thoroughly first with soap and water, then with an antiseptic solution. Her hands should never be put into the birth canal unless she is wearing sterile gloves.

Protecting the Perineum

In a normal delivery, the top of the descending fetal head puts increasing pressure on the perineum. The vagina opens until a circular area of the scalp shows during a contraction. This is called *crowning*. As the head is crowning the midwife should place her right hand on the head with the fingers spread to restrain sudden expulsion (birth) of the head. When the infant's chin has passed the mother's coccyx, the midwife should hold a towel or piece of gauze firmly under the vulva. This puts pressure on the infant's chin and assists in keeping the head flexed.

As the head crowns, the woman will have an almost uncontrollable urge to push or bear down. She should be encouraged to take short breaths and not push, because sudden expulsion of the head or shoulders can cause severe tearing of the perineum. The head should be allowed to come out slowly. The midwife's hand controls this movement.

Preventing Cord Complications

As soon as the head is out, the midwife should immediately look to see if the umbilical cord is around the neck. If the cord is present and loose, the midwife can slip it over the baby's head. Force should never be used, as a thin cord can break.

If the cord is tight, or wrapped several times, the midwife may have to quickly clamp or tie it in two places and cut between the ties. However, this procedure should be avoided whenever possible. Cutting the cord stops the baby's oxygen supply and fetal distress could result if delivery of the shoulders is delayed.

Clearing the Baby's Airway

The next contraction after the birth of the head usually causes the shoulders to rotate. They move into the anterior-posterior diameter of the outlet of the pelvis. This causes the head, which has been face-down, to turn toward the side.

During this time, the midwife should wipe the mucus and any blood and amniotic fluid from the baby's mouth. The nose and mouth should be cleaned with a suction bulb or mucus extractor, if available. This will prevent the mucus from being sucked into the baby's lungs with the first breath.

Delivery of the Shoulders

If the baby is not in distress, the shoulders should be allowed to deliver slowly. Delivery of the shoulders often occurs spontaneously with the next contraction. If not, the head may be gently depressed so that the anterior shoulder comes under the pubic bone. The arm should never be pulled out and strong pressure should never be put on the arm or shoulder. Force can cause fractures of the bones and damage to the nerves.

After the anterior shoulder is out, the baby's body may be gently lifted so the other shoulder can emerge. This should be done smoothly and gently, as sudden, strong movements could be dangerous.

12. Delivery of the Placenta

The time during which the placenta detaches itself from the uterine wall and is expelled, and the following hour are hazardous times for the mother. The midwife's most important task during this period is to recognize and prevent such problems as infection and hemorrhage.

Risk of Infection

The risk of infection is even greater at this time than during labor and the delivery of the baby. The mother's resistance to infection is diminished. The tissues of the birth canal have been bruised, stretched, and torn, making it easy for bacteria to invade. The placental site in the uterus is extremely vulnerable to infection.

Prevention of Hemorrhage

The midwife can assist in preventing hemorrhage by understanding the normal process of separation of the placenta and by properly managing the delivery of the placenta. The placenta normally remains attached to the uterus until the birth of the baby. The sudden decrease in size of the uterine cavity when the baby is born reduces the size of the area where the placenta is attached. This causes the placenta to begin to separate from the uterine wall. Blood accumulates behind the placenta, causing the uterus to rise in the abdomen. As uterine contractions begin, the placenta becomes completely detached. It is moved gradually into the lower segment of the uterus and is expelled through the vagina.

Most often the fetal surface of the placenta slips through the opening in the membranes and is the first to appear at the vaginal opening: the membranes follow. In this case, the accumulated blood and clots are not seen until the placenta is expelled: In some cases, one edge of the placenta slips through the cervix and vagina, and the maternal side is seen first. When this happens, the blood and clots escape as the placenta is being expelled. Which side of the placenta is delivered first is not important. The main concern is that all parts of the placenta and membranes are expelled.

By close observation and careful management, the midwife can help to insure that there is not excessive blood loss during this time. Immediately after the birth of the baby, the uterus should be palpated for consistency and location. As long as it is very firm and no higher than the umbilicus, no action is needed except to continue to watch for signs of excessive bleeding. At frequent intervals, she should place her hand lightly on the abdomen to make certain the uterine muscle remains firm. The midwife should make no attempt to remove the placenta before it separates. She should not massage or push on the uterus or pull on the cord. Signs that the placenta is separating can usually be noted with 1 to 5 minutes. These are:

(1) 30 to 60 cc of blood gushes from the vagina.
(2) The uterus rises in the abdomen. It should be firm. A soft, rising uterus indicates that blood is accumulating in the uterus.
(3) A longer portion of the cord becomes visible.

In some societies women traditionally give birth in a squatting position. In this position gravity aids in the descent of the placenta through the cervix and vagina. However, if the woman is lying on her back, the midwife may need to assist by gently pushing down and back on the firmly contracted uterus with one hand. The other hand is placed at the vaginal opening to receive the placenta. *THE MIDWIFE SHOULD NEVER PUSH ON A UTERUS THAT IS RELAXED AND SOFT. SHE SHOULD NEVER PUSH WITH FORCE ON ANY UTERUS.*

As the placenta begins to emerge, the midwife should support it with both hands or a basin. This prevents sudden tension on the membranes which might tear them before they are entirely separated. The placenta may be pulled up gently and the membranes twisted as they come out. All portions of the membranes must be expelled. A careful exam of the placenta and membranes should be done immediately to be sure they are normal and complete and that no portion remains in the uterus.

Examination of the Placenta

The placenta should be firm and a dark blue-red. The cord should be examined for the presence of three vessels, one larger vein and two smaller arteries. If only one artery is found, the chance that the baby will have some abnormality is increased.

The midwife should separate and carefully inspect the two layers of membranes to determine that there are no missing pieces. She should note that their size is sufficient to have contained the fetus and amniotic fluid. Holding the placenta flat with the fetal side and the cord in the hands and the maternal side up, the midwife notes whether all sections fit together. If any piece of the placenta is missing, the woman should be referred for medical care. Any placental tissue remaining in the uterus may cause bleeding immediately by preventing the uterus from contracting. It also may cause bleeding or infection later. Any woman who has retained fragments of placenta or membranes should have medical attention as soon as pos-

FIVE ESSENTIAL STEPS TO FOLLOW DURING THE BABY'S BIRTH

There are five essential steps to follow during the birth of the baby :

1- Take hygien precautions : hands should be washed once more ; wash the woman's perineum. There should be a clean mat or bed and linen.

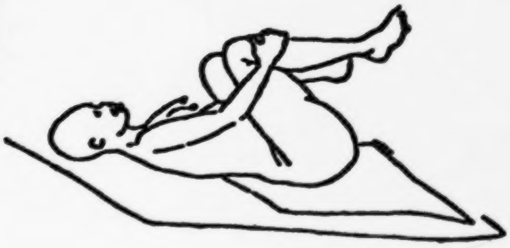
2- Wait until the woman feels the need to push so that the uterus is completely opened.

Ask the TBAs to repeat the five steps.

3- Help the baby to come into the world :
Support the perineum with a cloth and your hand. Hold the baby's head in order to make it come out slowly. Once the head has come out, make sure that the cord is not wrapped around the neck. Release the shoulders, one after the other.

Explain and demonstrate at the same time.

4- Clear the respiratory tract of the baby so that he/she can breathe
This can be done as follows :
- When only the head has come out and when the baby's body is still in the vagina or,
- When the baby is born, by holding the head down or extending it between the mother's legs.



The respiratory tract can be cleared in the following manner :
- with a piece of material wrapped around the finger (bandage from the kit)
- in sucking the mouth and the nose of the baby with your mouth.
- in using a bulb to suction the new born
- in using a small plastic tube to suction the baby.

All this must be done before :

5. Tying and cutting the cord
Wait until the cord is not beating any more. (the color changes from blue to a whitish color). The blood does not flow any more,
Tie the cord with a clean thread in two areas. Cut between the two bindings.
The razor blade must be new and just sterilized. A sterilized knife or scisors which have been boiled in water can be used to cut the cord.
Put a bandage (at the maternity clinic, bandages are no longer used). However, at the village, the wound that the cord left should be isolated from dust and soil.
In brief, there are five essential steps to make during the baby's birth :

1. take hygien precautions
2. wait until the woman pushes
3. hold the perineum, help the baby to come out slowly
4. help the baby to breathe
5. bind and cut the cord in a clean fashion

Session 33

HIGH RISK PREGNANCY

TOTAL TIME 2 hours

OVERVIEW In the previous session participants learned the signs and symptoms of pregnancy, to recognize the normal course of pregnancy and to provide counselling for the routine needs and common complaints of pregnancy. In this session, participants become familiar with traditional beliefs and practices related to behaviors during pregnancy and childbirth and the implications of these for management of complications and problems during this time. Participants also learn to recognize some important complications of pregnancy and when and how to refer a woman for further medical care. Participants will also become familiar with some of the potential problems in the delivery situation and how to respond appropriately to complications of childbirth and the immediate postpartum period.

OBJECTIVES

- To list traditional practices and beliefs related to pregnancy and childbirth -- especially those which address or explain complications and problems of pregnancy and childbirth.
  (Step 1)
- To recognize and describe some important complications of pregnancy and their management and referral.
  (Steps 2-4)

RESOURCES

- Community Culture and Care
- Where There Is No Doctor (Chapter 19)

Trainer Attachments:
- 33A Examples of Traditional Practices and Beliefs Related To Pregnancy
- 33B Causes of High Risk Pregnancy
- 33C Danger Signs During Pregnancy
- 33D Role Play
- 33E Complications During Labor and Delivery
- 33F Critical Incident

MATERIALS Newsprint, markers, pictures, diagrams, slide show/film (if available) on normal labor and delivery and postpartum care, props for role play (see Trainer Attachment 33D for details).

Trainer Note

In preparation for this session, the trainer should:

- review reliable country information regarding the traditional beliefs and practices related to pregnancy and childbirth
- gather information regarding the kinds and levels of cooperation/coordination ongoing between traditional birth attendants and medical facilities and personnel. (See also Session 6 (Health Care Delivery Systems) for information on the referral system and traditional practitioners.)

Additionally, the trainer should meet with MCH personnel regarding the maternal death rate and leading causes of morbidity and pregnancy complications in the country or region of training. If, for example, pelvic inflammatory disease (PID) is common, ectopic pregnancy rates would be expected to be higher and special attention should be given to this topic in this session. Other kinds of health issues which vary in different populations and cultures and have an important impact on problems related to pregnancy include: the availability of family planning methods (insofar as it effects the frequency of pregnancies), the incidence of venereal diseases, Sickle Cell disease, TB, Malaria, twinning rates, the legality of abortion, etc.. The session should be adapted to be sure that emphasis is given to the special problems in specific countries.

Prior to this session, the trainer should also ask five or six volunteers to assist in (a) a mini-lecturette on high-risk pregnancy for Step 2 and (b) a role play for Step 3 . See Trainer Attachments 33B, 33C and 33E for details.

Step 1
(20 min)

Traditional Beliefs Related To Pregnancy

Ask participants to share information or first-hand experience regarding reproductive or pregnancy-related beliefs and practices in the village.

Have another participant record the practices and beliefs on newsprint and discuss any implications these beliefs and practices have for the development of high risk pregnancies. For the traditional health practitioner, discuss community response to the development of complications in pregnancy or delivery and poor outcome in the newborn.

Trainer Note

If participants have had little village experience, be prepared to give a brief presentation on village practices and beliefs on reproduction, pregnancy and delivery. If nationals or counterparts are present, meet with them before this session and ask them to give the presentation with your assistance. Refer to Trainer Attachment 33A for the kinds of information to be shared and the general reasoning of the presentation.

To start off the discussion you may want to give the example in Trainer Attachment 33A (Examples of Traditional Practices and Beliefs Related to Pregnancy). Another example to use may be the fact that a spontaneous abortion, prolonged or obstructed labor or birth defect of the newborn may not be treated as a medical emergency but may be "blamed" on the woman and seen as "just punishment" for her disobedience of some taboo, etc. If this is the case in your country, it may be important and valuable to discuss the participant's emotional responses to these hypothetical situations and how to constructively work with the different interpretations of the situation.

Be sensitive to the cultural values regarding the discussion of reproduction and pregnancy in a mixed gender group. If nationals/counterparts are present and discussion of these issues is inappropriate in a mixed group, have the group divide into single-gender groups for discussion and reconvene later. Be alert to any discomfort which this topic may evoke and handle it as openly as possible. Also use it as an opportunity to discuss how dialogue can proceed in the village setting.

Step 2
(30 min)

Identifying High Risk Pregnancies

Based on the foregoing discussion and the incidence of specific pregnancy complications in your country, select the most frequent and most serious pregnancy, delivery or post-partum complication(s) and give a 15 minute mini-lecturette on it and how to refer a suspected case for further medical care in a village setting. Base the lecturette on information from Trainer Attachments 33B and 33C. In giving the presentation, elicit as much information as possible from the group.

After the lecturette, ask the group to think of other complications or danger signs they know of which they think require referral. Ask an individual from the group to record these on newsprint. After they've shared their ideas, post the newsprint list of danger signs and diseases prepared prior to this session from Trainer Attachment 33B and review it with the group. Be sure you are thoroughly familiar with the signs and diseases so you can answer questions as they arise, or invite an informed national health professional to assist you in this step.

Trainer Note

Prior to this step, write the list of danger signs of pregnancy from Trainer Attachment 33B on newsprint for posting and discussion.

Step 3
(15 min)

Role Play

Ask the preselected participants to conduct the role play demonstrating a delivery with complications based on Trainer Attachment 33D and 33E.

Instruct the group to watch the skit closely, observing the behaviors of all involved, and taking notes if necessary so they can discuss it afterwards.

Trainer Note

Be sure the participants have had a chance to rehearse or plan in advance and that you have developed a list of questions to ask the group after the role play.

Step 4
(20 min)

Role Play Analysis

Ask someone from the group to describe what happened in the role play and have other participants discuss what they saw. After the "audience" has done this, ask the role players to clarify any questions or misunderstandings about what occurred and have them describe both the TBA's errors in managing the delivery and the physical complications they were portraying.

Base other role play processing questions on the content of the role play and the specific problems in the delivery scene which the participants enacted.

Step 5
(25 min)

Closure

Adapt the critical incident found in Trainer Attachment 33F and read it to the group. After the reading facilitate a discussion of the critical incident. Address these questions to the participants:

- Objectively what happened in this situation?
- Could you relate to the Volunteers reactions and feelings? How would you have reacted?
- Could you understand the host country national's feelings and behavior? Why did he react that way?
- How is childbirth and pregnancy regarded in this culture?
- What will you have to do differently given the cultural beliefs/attitudes/traditions surrounding pregnancy and childbirth in this culture?

Trainer Note

You should adapt the critical incident to local cultures and include indications of high risk pregnancy and complications at delivery. During the discussion, participants should be encouraged to incorporate the knowledge they have gained on care for normal and high risk pregnancies and how this information may prove useful in developing program activities to improve maternal health.

EXAMPLES OF TRADITIONAL PRACTICES AND BELIEFS RELATED TO PREGNANCY

Among the Mende, the fear of witches, juju curses, and other supernatural activities is widespread and it is believed that certain precautionary measures must be taken to safeguard the mother and fetus against them. One purveyor of such notions is the TBA. Most of the pregnancy-related codes of conduct are based on the idea that the child in the womb imitates its mother and can be affected in its development by forces acting in or on the mother. Some of the taboos and the justifications given for them are as follows:

Foods to be avoided during pregnancy[1]	Reason
Beans (and other vine plants)	causes strangulation by the cord
Cassava tuber	causes the cord stump to take too long in dropping off
Coconut milk	causes postpartum haemorage
Eggs	causes infant asphyxia and various other problems, as the egg is the unborn child of the chicken, which is a sacred bird for the Mende; therefore, reprisal may be taken against one's own child.
Fish	causes worms in newborn babies and pregnant women, which may lead in turn to "unclean stomach" and diarrhoea
Eggplant	causes thrush or skin disease in the newborn
Plantain or banana	causes prolapsed cord, sunken fontanelle, retained placenta, and constipation in the mother

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[1] Plenty of fresh fruit, rice, and palm oil are encouraged as part of the pregnant woman's diet.

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Practices to be avoided during pregnancy	Reason
Standing in the doorway	causes obstructed labour
Standing with arms crossed over breast	causes obstructed labour
Sleeping too much and not moving about	causes uterine inertia and dull child
Going halfway on any journey and then returning to place of orgin	causes prolonged and difficult labour
Washing heavy clothing Lifting heavy loads Intercourse after sixth month of pregnancy Extramarital intercourse Dreaming of extramarital intercourse	cause abortion
Talking about unborn child or making preparation for its arrival (purchasing clothes, making layette, etc.). Wearing new clothes during pregnancy.	cause various problems by drawing attention of witches who may use words or articles as vehicle for evil curses
Sitting on the edge of a wooden bed	causes sunken fontanelle
Splitting wood Fishing too long Planting rice Drinking leftover (stale) water	cause prematurity
Engaging in antisocial behaviour, e.g., arguing with co-wives, friends, husband, or other contacts	causes various problems by drawing evil spirits and creating potential for curse to be invoked
Wearing a brassiere or tossing one's lappa (sarong-type skirt) around neck	causes nuchal cord
Bathing at night Walking about at night without protection of a stone or knife tied in corner of lappa	cause fetal abnormalities since these practices will draw evil spirits
Resting in an easy chair or hammock	causes face presentation
Standing at crossroads	causes tranverse lie and difficult labour

The above are listed here as examples only of the kinds of beliefs and practices which may be relevant to share on traditional beliefs and practices about pregnancy and childbirth. The implications of these kinds of beliefs for care and potential high-risk pregnancy/delivery development should be discussed in depth. For example, since eating eggs and fish are believed to cause negative outcomes in the culture referred to above, women are supposed to avoid these foods. If these are the primary sources of protein in the local diet, alternative sources may be difficult to find and severe anemia may therefore be a more frequent complication of pregnancy in this area.

(From: WHO Public Health Paper #75. "The Traditional Birth Attendant in Seven Countries: Case Studies in Utilization and Training." 1981.)

Session 33, Trainer Attachment 33B
Page 1 of 2

CAUSES OF HIGH RISK PREGNANCY

Examples of danger signs during pregnancy and diseases which can be exacerbated during pregnancy are:

1. History of Diseases, such as TB, Diabetes, Venereal Disease, Heart Disease, other major illness.
2. History of Miscarriages, Abortions, bleeding, Toxemia, difficult delivery, still-births or neonatal deaths.
3. Age - under 17 and over 35.
4. Height under 5 feet.
5. Malnutrition (or overweight)
6. Abnormal weight gain (not enough or greater than 5 lb/mo.)
7. Blood pressure over 130/80 (or persistant headaches)
8. Any complaints of:

Spots before eyes Dizziness	indicate pre-eclampsia
Acute abdominal pain Persistant abdominal cramping	may indicate abortion or ectopic pregnancy

9. Anemia (pale conjunctiva, pale fingernails, fatigue)
10. Edema (swelling of face, hands or feet)
11. Abnormal bleeding: slight or excessive
12. Abnormal size or shape of Uterus (multiple birth, other complications)
13. Abnormal Presentation (e.g. breech, transverse)
14. Abnormal Urine Test (presence of protein (Albumen), presence of sugar)
15. Ectopic Pregnancy
16. Infection after induced abortion
17. Sickle Cell Disease
18. Malaria
19. Fetal Death (often indicated by lack of fetal movement or by bleeding)
20. Pre-eclampsia or Eclampsia

For further information see the following reference materials:

Practical Mother and Child Health in Developing Countries

Where There Is No Doctor

Handbook for Health Personnel in Rural Liberia

Home Nursing Textbook, ("Emergency Delivery").

II. Trainer should make the following points to participants:

- Danger Signs/Complications should always be handled by medical personnel (e.g. a doctor, nurse, trained midwife). Therefore generalists should always refer such cases.

- In case of doubt regarding signs/symptoms/treatment, a nurse should obtain a second opinion or refer the patient.

- In a clinical setting, generalists should primarily play the role of providers of health education, e.g. as a follow-up to the prenatal exam. However, additional functions may be carried out (e.g. measuring weight, height). More complicated procedures should not be undertaken unless adequate training has been provided.

DANGER SIGNS DURING PREGNANCY

Signs that Indicate Pregnant Woman Should Report to Clinic, Midwife, or Physician

Vaginal bleeding
Sudden escape of amniotic fluid
Abdominal pain
Persistent vomiting
Chills and fever

Sudden increase in abdominal size
Sudden weight gain
Swelling of hands, face, or feet
Severe, continuous headache
Blurring of vision or spots before eyes
Signs of Toxemia

While pregnancy and childbirth are normal physiological processes, they are periods of stress and risk to the mother and infant. The three most frequent causes of death during pregnancy and childbirth are hemorrhage, infection, and toxemia of pregnancy.

Hemorrhage, or excessive bleeding, is a sign of a serious problem when it occurs at any time during pregnancy. Two common causes of bleeding in the last 3 months of pregnancy are placenta previa and premature separation of the placenta.

Placenta Previa

Normally the placenta is attached to the lining of the uterus in the upper portion of the uterus. Occasionally the placenta is implanted in the lower part of the uterus. This is called *placenta previa*, which means that the placenta is in front of the fetus. The placenta may completely cover the internal os (the opening of the cervix), partially cover it, or adjoin, but not cover, any part of the os.

Placenta previa usually begins to cause problems in the last weeks of pregnancy or at the beginning of labor, when the cervix softens, effaces (thins), and begins to dilate. As these changes occur, the placenta is pulled loose, and bleeding results. The more completely the placenta covers the cervical os, the earlier bleeding occurs. If the placenta only adjoins rather than covers the cervix, bleeding may not occur until labor begins.

Placenta previa occurs most frequently in women who have had several previous pregnancies, especially when they have been in rapid succession. However, it should be suspected any time a woman has painless vaginal bleeding without any other apparent cause in the latter months of pregnancy. Often the woman notices the bleeding when she awakens or goes to the bathroom. The bleeding frequently stops spontaneously, but then recurs. Each time it occurs, the bleeding becomes more severe.

Placenta previa is dangerous for both the mother and the fetus. If bleeding is severe, the mother suffers from the blood loss and may go into shock. Because the placenta is in the lower portion of the uterus where the presenting part should be, the fetus may be forced into an abnormal position or presentation. Rupture of the uterus is possible because the uterine muscle is weakened. After delivery, women who have had placenta previa are more likely to have postpartum hemorrhage and infection. The fetus is at high risk. When the placenta detaches, the fetus loses its source of oxygen. Lack of oxygen is a common cause of fetal death.

Any woman who bleeds while in the last trimester of pregnancy or during labor should be referred immediately to a hospital for evaluation and care. Safe diagnosis of the condition requires special equipment such as x-ray and ultrasound. ***The nurse or midwife should never perform a vaginal or rectal exam on any woman with painless vaginal bleeding.*** If the bleeding is caused by placenta previa, the examining finger could penetrate the placenta resulting in massive hemorrhage.

Premature Separation of the Placenta

Another cause of bleeding during the last months of pregnancy or during labor is the separation of a normally implanted placenta from the uterine wall before delivery of the baby. Although the exact cause is not known, premature separation of the placenta occurs more frequently in women who have elevated blood pressure, especially when associated with toxemia of pregnancy.

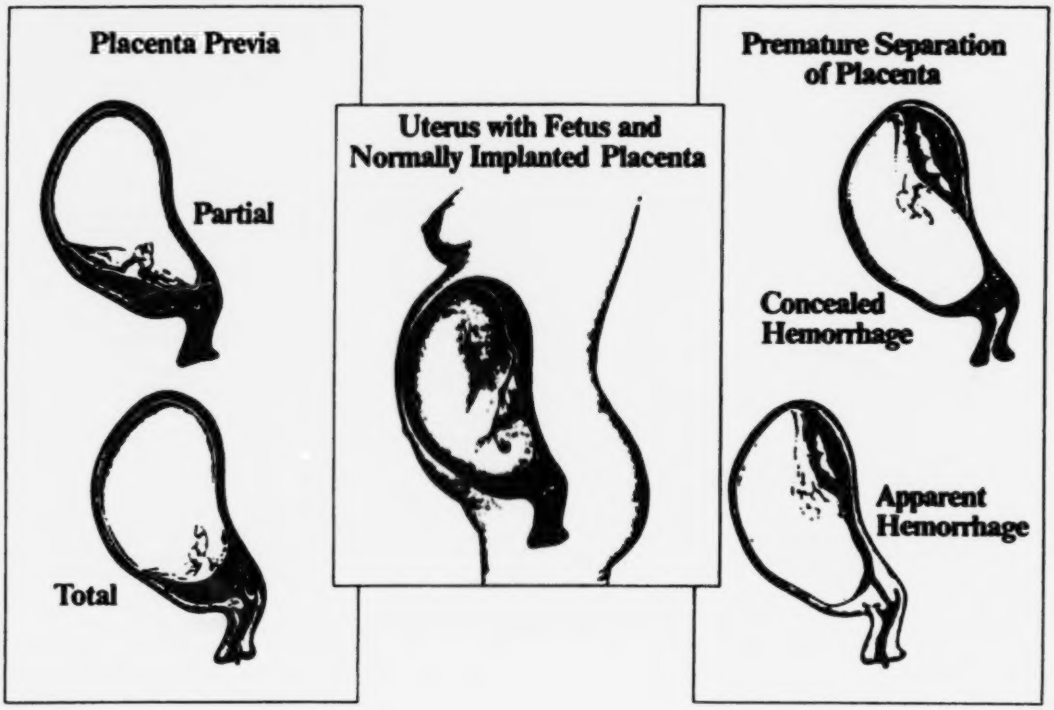
Either a very small portion of the placenta or the entire placenta may detach. Signs and symptoms vary with the amount of detachment and the location of the detached area. Usually, some blood escapes between the membranes and uterus, appearing as vaginal bleeding. Less often, the blood may remain trapped between the detached portion of the placenta and the uterus. In such cases, no vaginal bleeding is noted, even though the woman may be losing large amounts of blood.

In all cases, the woman will have cramping abdominal pain, which should not be confused with normal labor contractions. When premature separation of the placenta has occurred, the uterus remains continually tense and hard, rather than alternately contracting and relaxing as it does during labor. When the hemorrhage is concealed, it is difficult to palpate the fetal outline because of the tenseness of the uterine muscle. If detachment is severe, fetal heart tones are absent, as the fetus has died from lack of oxygen.

Symptoms of shock may be present if blood loss has been excessive. Signs of shock include abnormally low blood pressure, rapid pulse, pallor, and apprehension.

Any woman in labor or late pregnancy who displays symptoms of premature separation of the placenta should be transferred immediately to a hospital. Meanwhile she should be kept quiet and warm.

Danger Signs During Pregnancy: Third Trimester Bleeding


Placenta Previa
Partial
Total
Uterus with Fetus and Normally Implanted Placenta
Premature Separation of Placenta
Concealed Hemorrhage
Apparent Hemorrhage

7. Danger Signs During Pregnancy—Toxemia

One of the most serious problems that occur during pregnancy is toxemia or preeclampsia. A condition specific to pregnancy, preeclampsia is characterized by a sharp increase in blood pressure, edema (swelling), sudden excessive weight gain, and protein in the urine. It can occur in the last three months of pregnancy, during labor, or in the first few hours after delivery. The exact cause of the condition is still not understood.

Toxemia of pregnancy can be identified early in the milder stages, before the condition becomes life threatening. The first sign of the problem usually is a weight gain of more than 1 kg per week or 3 kg per month during the last three months of pregnancy. Also, there probably will be some edema (swelling). Swelling of the feet, which tends to disappear overnight with rest, is very common during a normal pregnancy. However, swelling of the upper parts of the body such as the hands and face should alert the midwife to consider that toxemia may be the cause. The woman may have noted that her ring is tight on the finger or that her eyes are "puffy."

Another sign of toxemia is a sharp increase in blood pressure above the previous levels during pregnancy. An increase of 30 mm Hg systolic or 15 mm Hg diastolic is considered significant.

Protein or albumin in the urine is another important sign of toxemia. This finding is one that often does not appear until the condition has become advanced and severe.

Pregnant women with any of these signs should be under medical supervision. Toxemia can develop rapidly from a mild condition, with slightly elevated blood pressure, mild edema and slight weight gain, to a serious problem with very high blood pressure and severe edema. It can become so severe that it results in convulsions and coma. When this occurs, it is called eclampsia. Eclampsia is a life-threatening situation for mother and infant.

Signs that the condition is becoming more severe include the following:

- Sharp increase in blood pressure
- Exaggerated reflexes
- Epigastric pain (pain in the upper middle region of the abdomen)
- Visual disturbances such as spots before the eyes
- Dizziness
- Drowsiness
- Severe headache
- Decreased urinary output

A woman with these symptoms is in serious danger. She should be sent to a hospital immediately.

Prevention and Detection

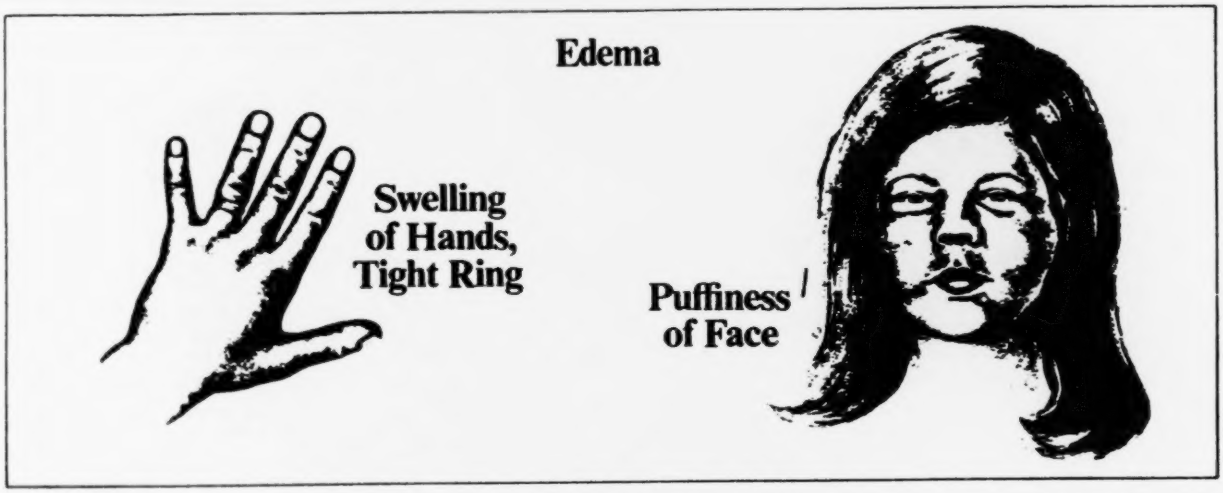
To lessen the dangers of toxemia of pregnancy, prenatal care is essential. All pregnant women, but especially those considered to be at high risk for toxemia, should report to the local doctor, midwife, or community health worker for regular prenatal visits. High-risk women include the following:

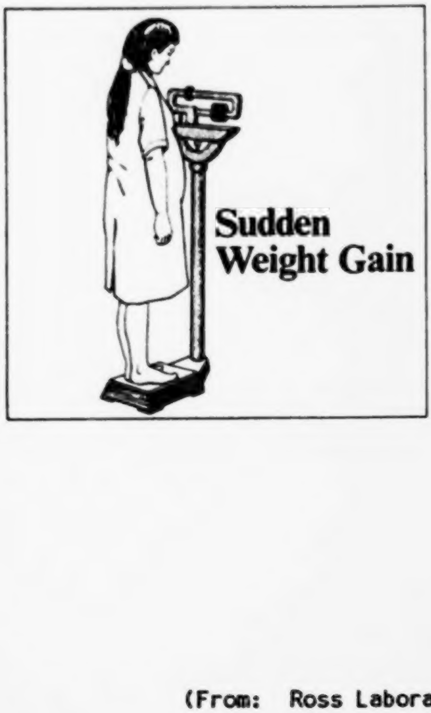
- those who are pregnant for the first time
- those who are under 20 years of age
- those who are malnourished
- those who are pregnant with more than one fetus
- those who have a history of heart disease, diabetes, or elevated blood pressure

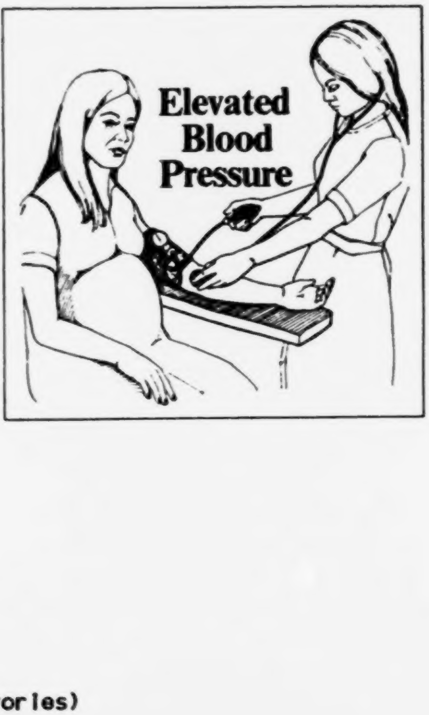
At each prenatal visit, the woman's weight and blood pressure should be measured and her urine examined for presence of albumin. The woman should be observed for the presence of edema. She should be asked about the other signs of preeclampsia such as visual disturbances, headaches, and epigastric pain. If the woman has a slight elevation of blood pressure (an increase less than 30 mm Hg systolic or 15 mm Hg diastolic) she should be instructed to restrict her activity, to stay in bed if possible, and to eat a diet high in protein. If the blood pressure increase exceeds those levels or if other symptoms are present, the woman should be referred for medical management.

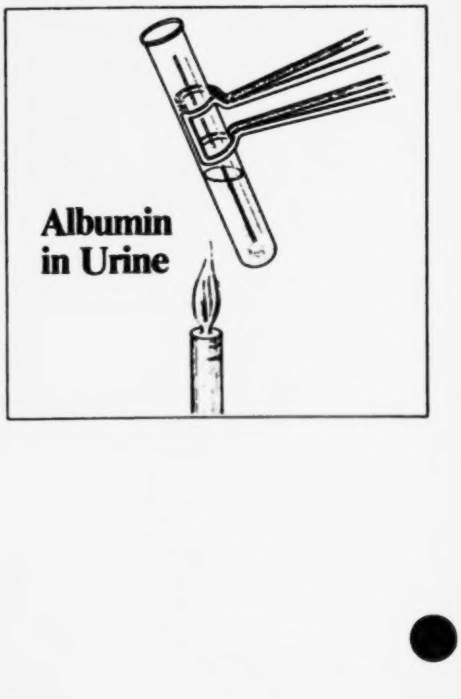
Malnourished women are more susceptible to preeclampsia. Health education to improve dietary habits in the population can help to lessen the incidence of the problem. The midwife should be aware of the local foods that are high in protein, relatively inexpensive, and readily available.

Toxemia of Pregnancy


Edema
Swelling of Hands, Tight Ring
Puffiness of Face


Sudden Weight Gain


Elevated Blood Pressure


Albumin in Urine

(From: Ross Laboratories)

Session 33, Trainer Attachment 33D

ROLE PLAY/SKIT

Ask three or four participants to develop a role play/skit on childbirth in which both the delivery itself is problematic and the birth attendant uses problematic techniques and non-sterile methods in delivering the baby.

No resolution to the problems presented in the role play need to be offered, just a realistic portrayal of the problems. The "task" of the audience will be to identify and resolve the problems as best they can.

Roles:	Mother.	This woman should of some specified age which should be told to the audience. The number of children she has and her relevant medical/obstetrical history should be shared with the audience also.
	Traditional Birth Attendants	This woman (or women) should be attired traditionally and should have props which represent her as a village TBA. If they are trained in your country, she may be trained.
	Other Support Person(s)	Depending on the typical family structure in your country, this person may be the maternal or fraternal grandmother of the baby-to-be, a co-wife of the pregnant woman in labor, a sister of the pregnant woman, the husband, another TBA, etc. Make it as realistic as possible.
	Optional.	This person may assist in the role play planning or be a narrator, etc.

Suggestions for the Role Play

Present a realistic country-specific situation in which the TBA is engaging in unrecommended procedures such as:

- attempting to hurry delivery by roughly pushing on the mother's belly
- cutting the umbilical cord with an old pair of scissors or rusty razor blade that has not been cleaned
- putting cow dung or some juice, wet ointment, etc., on the stub of the umbilical cord, etc.
- Add country-specific situations that make the skit realistic.

You may also want to present realistic complications of childbirth such as: premature labor occurring in the field while farming, breech presentation of twins, profuse bleeding after delivery, prolonged labor that has gone on for over 24 hours, the mother begins having unilateral (one-sided) pain and a fever and cramps early in the first 12 weeks of pregnancy (indicating a possible ectopic pregnancy), etc. Refer to Trainer Attachment 33E for information on complications during labor and delivery. You should incorporate this information in your skit.

COMPLICATIONS DURING LABOR AND DELIVERY

Signs of Fetal Distress

1. Variations in rate of fetal heart tones
2. Excessive fetal movements
3. Meconium stained amniotic fluid

Danger Signs in the Mother

1. Fever
2. Increased pulse rate and/or decreased blood pressure
3. Increased blood pressure
4. Headache, dizziness, vomiting
5. Very fast, deep breathing (hyperventilation)
6. Increasing apprehension
7. Vaginal bleeding
8. Distended bladder
9. Abnormal presentation or position of fetus
10. Prolapse of the umbilical cord
11. Abnormal uterine action
12. Prolonged or arrested labor

Multiple Pregnancy

Labor is a normal process and most women will go through the experience safely and deliver healthy babies. However, risks are involved. By anticipating possible problems and recognizing them early, the midwife can make labor and delivery safer.

She should be aware of the normal variations in the process of labor and of those signs that labor is not progressing normally. She should know the signs that indicate the mother's or infant's safety is threatened.

Signs of Fetal Distress

1. *Variations in Rate of Fetal Heart Tones.* Fetal heart rates that are faster than 160 per minute, slower than 120 per minute, or a rate that significantly changes are signs of fetal distress.

2. *Excessive Fetal Movements.* Fetal movements are a positive sign that the fetus is alive. However, a noticeable increase in movements, especially if accompanied by changes in fetal heart rates or the presence of meconium in the amniotic fluid, is a sign of fetal distress.

3. *Meconium-stained Amniotic Fluid.* Meconium is the dark green sticky substance that normally is in the intestine of the fetus. Normally, meconium is passed as the first stool of the newborn. However, the fetus who lacks enough oxygen may pass meconium while still in the uterus. The meconium mixes with the normally clear amniotic fluid, giving it a light yellow-green to dark green color. Meconium-stained amniotic fluid in a fetus whose head is presenting is always a sign of fetal distress. However, if the fetus is in a breech position, it is not unusual for some meconium to be forced out of the fetus' body by pressure of the uterine contractions.

Danger Signs in the Mother

1. *Fever.* A slightly elevated temperature may be caused by lack of adequate fluids. A higher temperature or fever that persists may mean an infection is present.

2. *Increased Pulse Rate (Over 100 per Minute)* and/or Decreased Blood Pressure. These could indicate bleeding.

3. *Increased Blood Pressure.* A blood pressure over 140/90 is a sign of toxemia. A rise of 30 mm Hg or more of systolic pressure or a rise of 15 mm Hg in diastolic pressure over previous readings is equally significant.

4. *Headache, Dizziness, or Vomiting.* These signs indicate serious danger of eclampsia, especially if accompanied by increasing blood pressure.

5. *Very Fast, Deep Breathing.* A woman in labor may respond to her increasing discomfort and apprehension by rapid, deep breathing. This causes chemical changes in the body that can be harmful to both mother and fetus. These changes cause the woman to feel tingling and numbness in her hands and feet. She should be encouraged to slow her breathing. Breathing into a paper bag so she takes in the same air again will help relieve the problem.

6. *Increasing Apprehension.* The woman's feeling that "all is not right" may be a sign of difficulty in labor.

7. *Vaginal Bleeding.* Any vaginal bleeding more severe than the pink-tinged bloody show is a sign of a serious problem. It can be caused by placenta previa, premature separation of the placenta, or ruptured uterus.

8. *Distended Bladder.* Distention of the urinary bladder is a common avoidable problem during labor. Because the woman in labor is already feeling pressure and discomfort in her lower abdomen, she may not recognize the need to pass urine. A distended bladder adds to the woman's discomfort. It can also interfere with the descent of the fetal head and inhibit uterine contractions. The midwife can prevent this problem by encouraging the woman to empty her bladder every 2 to 3 hours during labor. The midwife also should observe and palpate the lower abdomen to detect a distended bladder. A full bladder can be felt as a soft swelling over the pubic area.

9. *Abnormal Presentation or Position of the Fetus.* In breech, face, or transverse presentations, labor and delivery will be complicated. In all such cases the woman should be referred to a hospital.

10. *Prolapse of the Umbilical Cord.* An umbilical cord on a level with or below the presenting part of the fetus can become pressed between the presenting part and the birth canal. The pressure can close off the blood flow in the cord. This prevents the fetus from receiving adequate oxygen. If the cord protrudes from the vagina, chilling can cause spasms of the blood vessels which decrease the blood flow and oxygen supply to the fetus.

    A prolapsed cord is more likely to occur when the membranes rupture before the presenting part enters the pelvic inlet. Prolapsed cord can be expected more frequently in the following cases: breech presentation, very small fetus, excessive amniotic fluid, or multiple gestation, such as twins or triplets. The possibility of prolapsed cord should be suspected when signs of fetal distress, such as changes in the fetal heart rate or meconium staining of amniotic fluid, occur. Sometimes the cord can be felt in the vagina or seen protruding outside the vulva.

    Any pressure on the cord *must* be relieved immediately; otherwise the fetus will die from lack of oxygen. The mother should be placed in knee-chest position (on her knees and elbows, with her face and chest touching the bed) or on her side with pillows under her hips. If the cord is outside the vulva, it should be gently placed in the vagina. The midwife should not try to replace it in the uterus. Until the woman reaches a hospital, she must be kept in a position so the presenting part of the fetus is elevated.

11. *Abnormal Uterine Action.* Early uterine contractions usually are mild, with the uterine muscle becoming firm, but not hard. They may occur as far apart as 40 to 45 minutes when measured from the beginning of one to the beginning of the next. At this point, contractions rarely last longer than 30 seconds.

    As labor progresses the contractions become stronger and more frequent and last longer. When delivery is near, contractions may come as often as every 2 to 3 minutes and last 60 seconds. During a strong contraction, the uterus rises noticeably, and the muscle becomes so hard that the examining fingers cannot indent it. Normally, the uterus relaxes between contractions.

    Two kinds of abnormal uterine action signal danger; contractions that remain short and infrequent and contractions that last too long or occur too frequently.

    Contractions that remain short,-irregular, and infrequent do not bring about delivery of the baby. The mother becomes exhausted, and no progress in labor is made. Such abnormal uterine action may be caused by an overdistended uterus, an abnormal fetal position, or a pelvis that is not adequate to deliver a fetus of that size. The reason for the short, irregular contractions needs to be investigated.

    Contractions that last longer than 70 seconds or come closer than every 2 minutes are dangerous for the fetus. When the uterus is contracted, the oxygen supply to the fetus is decreased. Very long, hard, frequent contractions also can lead to rupture of the uterus.

12. ***Prolonged or Arrested Labor.*** When labor progresses normally and no serious complications occur, the baby usually is born within 14 to 15 hours when it is a first delivery or within 8 to 9 hours when the woman has previously delivered a baby. Labor is considered prolonged when more than 12 hours pass from the beginning of regular uterine contractions until the cervix if effaced and dilated.

    The second stage of labor—from the time the cervix is completely dilated until the birth of the baby—usually lasts no more than 1 hour; it may be only a few minutes in a woman who has previously delivered. A second stage lasting more than two hours is a cause for concern and should be investigated. Prolonged labor can lead to such serious problems as fetal injury and ruptured uterus.

Multiple Pregnancy

Multiple pregnancy, or the presence of more than one fetus, is a complication that may cause problems during pregnancy, delivery, or in the postdelivery period. Multiple pregnancies are more common among nonwhite mothers. The incidence also increases with the mother's age and the number of previous pregnancies. Multiple pregnancy should be suspected when any of the following occurs.

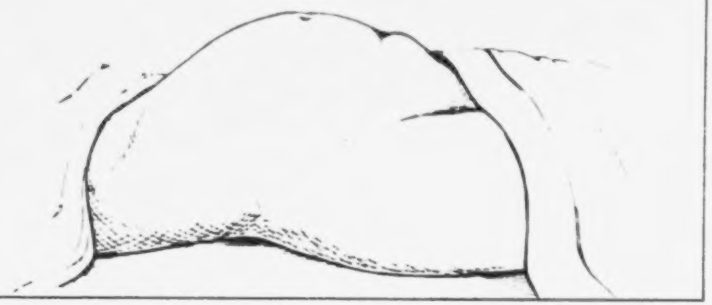
- Uterine size increases abnormally fast or is larger than expected
- Two or more fetal heart rates, distinct from each other and from the mother's pulse rate, are heard
- Abdominal palpation reveals the presence of extra fetal small parts and/or more than one head

The woman who is pregnant with more than one fetus is at risk and needs special care. Her body is under additional stress because more than one fetus is making demands on her body and its stores. She is more at risk nutritionally and is therefore more likely to develop anemia. She also is more likely to develop toxemia of pregnancy or to have excessive amniotic fluid. A woman carrying more than one fetus is more likely to go into labor early and deliver the babies prematurely. Prolapsed cord occurs more frequently during multiple births, and there is danger of the placenta separating before the second infant is born. During the postpartum period, the new mother is more likely to have excessive bleeding.

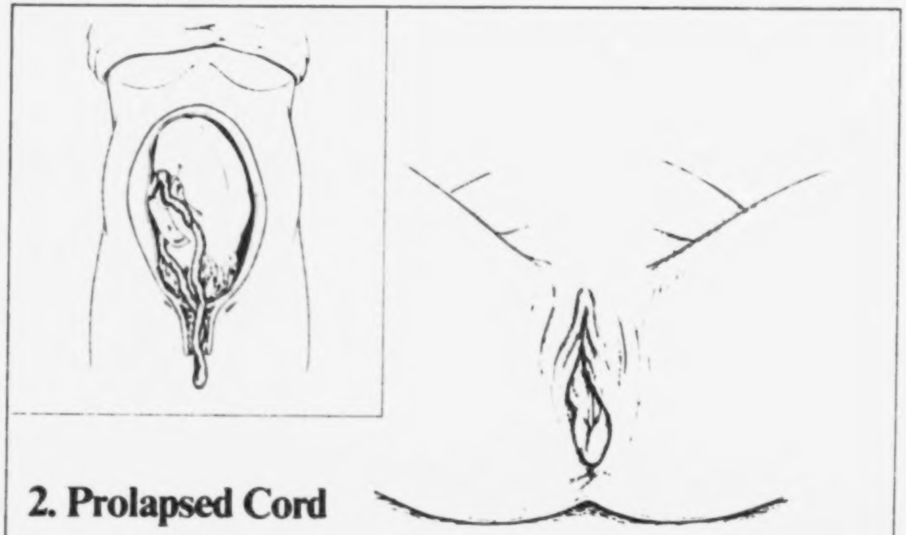
Any woman who is suspected of having more than one fetus should receive medical supervision during pregnancy. During pregnancy, the woman needs more frequent, careful assessment. Her needs for protein, vitamin supplements, and iron are increased. She should receive instruction on reducing daily activity, changing position frequently, and obtaining a proper balance of exercise and rest. Emotional support is important. The multiple pregnancy may make the woman happy, sad, afraid, or overwhelmed, depending upon her own situation and the culture in which she lives. The midwife can help by recognizing the signs of a multiple pregnancy, by providing the best physical care available, and by offering needed emotional support.

The woman with multiple fetuses should plan to deliver in a hospital.

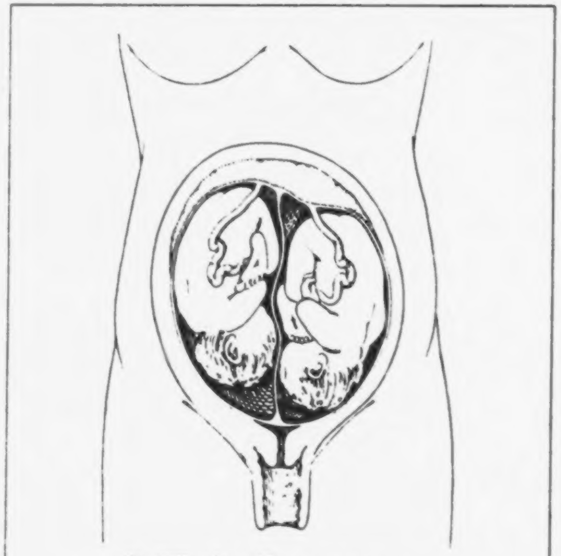
9.Complications of Labor and Delivery



1. Distended Bladder



2. Prolapsed Cord



3. Twin Pregnancy

Danger Signs During Postpartum

- Excessive vaginal bleeding (over 500 ml within 24 hour period)
- Bright red bleeding after first few days
- Reddish color of vaginal discharge lasting more than 2 weeks
- Foul-smelling vaginal discharge
- Uterus palpable above pubic bone after 10 days
- Fever or chills
- Abdominal pain and tenderness
- Pain or pressure in perineal area
- Pain, swelling, or redness of leg
- Cracked nipples or pain, swelling, or redness of breast

Prevention of Postpartum Problems

Hemorrhage and infection are the two most prevalent and dangerous problems of the mother during the first few weeks after delivery. The midwife can prevent these by giving conscientious and knowledgeable care in the early postpartum period.

Hemorrhage

The most common reason for hemorrhage after delivery is failure of the uterus to remain contracted. The period of greatest danger is the first hour or two after delivery.

The woman who has just delivered needs to be under constant observation at least for the first hour after delivery. The midwife must make sure that the mother is reacting satisfactorily to the stress of delivery, that her uterus is remaining well-contracted and that bleeding is not excessive. After the separation of the placenta from the uterine wall, the contracting of the muscular wall of the uterus constricts the blood vessels. This prevents excessive bleeding from the placental site. If the uterus becomes relaxed, severe bleeding could result.

During the first hour after delivery, the firmness of the uterus should be examined every 10 to 15 minutes, or more often if it is not remaining firm. With the mother relaxed and lying on her back with her legs flexed, the midwife palpates the fundus (top of the uterus) by cupping one hand above the uterus; the other hand supports the cervix (bottom of the uterus). The fundus should be felt at the midline of the abdomen at about the level of the umbilicus. It may be slightly higher if the woman has delivered twins or if she has had several previous deliveries. The uterus may lie to one side and be higher than normal if the woman's bladder is full. In this case she should be encouraged to pass urine, as a full bladder may prevent the uterus from contracting properly. If the uterus feels soft, it should be massaged gently. To massage the uterus, the hands are in the same position as they are for the examination.

At the same time, as the uterus is palpated, the mother's pad and the bed under her should be checked to be sure she has not been excessively hemorrhaging. If the bleeding exceeds 500 cc or if massaging the uterus does not control the hemorrhage, the woman should be taken to a hospital.

The mother's pulse and blood pressure should also be taken every 10 to 15 minutes during this initial period. Any drop in blood pressure or increase in pulse could indicate the possibility of hemorrhage. However, a normal pulse rate and blood pressure reading does not mean that the woman is not bleeding. Because of the normal changes during pregnancy the woman who has just delivered often will not show changes in pulse and blood pressure until bleeding has become excessive.

Infection

Infection of the reproductive tract after delivery has been a dreaded complication of childbirth since ancient times. Today we understand that it is caused by bacteria introduced into the reproductive tract during labor, delivery, or the immediate postdelivery period. The warm, moist uterine cavity, especially the placental site, provides an ideal place for bacteria to grow. The bacteria that most often cause the infection are those that normally live in the genital or intestinal tract or the nose and throat. The bacteria may be carried up into the uterine cavity where they multiply and cause infection. Infection is especially a problem when membranes rupture a long time before delivery or when labor is prolonged. Women who are poorly nourished or anemic and women who have had excessive blood loss during delivery are particularly at risk to infection.

Infection in the postpartum period most often involves the uterine lining. Symptoms usually appear between 2 to 5 days after delivery. Slight fever, loss of appetite and lack of energy are the first signs. Lochia (vaginal discharge) may be excessive and foul smelling or it may be scant, depending on the organism. Severe infections result in high fever, rapid pulse, chills, abdominal tenderness, and deep pelvic pain. Severe infections may spread into the muscle of the uterus and into the surrounding tissue. The organism may travel through the blood stream to the entire body. Although postpartum infection today can be treated today with antibiotics, it remains a serious complication. Any woman who shows symptoms of a postpartum infection should receive medical treatment as soon as possible.

Every precaution should be taken to prevent postpartum infections. Careful handwashing is an obvious precaution.

which should not be forgotten because of its simplicity. Everyone caring for the patient in labor, during delivery, or after delivery always should wash their hands thoroughly before touching the woman. Hand washing is especially important if the same person has been caring for other women. Sterile gloves, if available, should be worn during delivery. Ungloved hands should never be put into the birth canal.

Anyone with skin infections, such as boils or abscesses, should not care for a woman during or immediately after delivery. The midwife should take care to avoid coughing or breathing on the patient. This is especially important if the midwife has a sore throat, runny nose, or other signs of upper respiratory infections. The area where the woman will deliver should be as clean as possible and be free of flies and dust.

Normal Physiological Changes

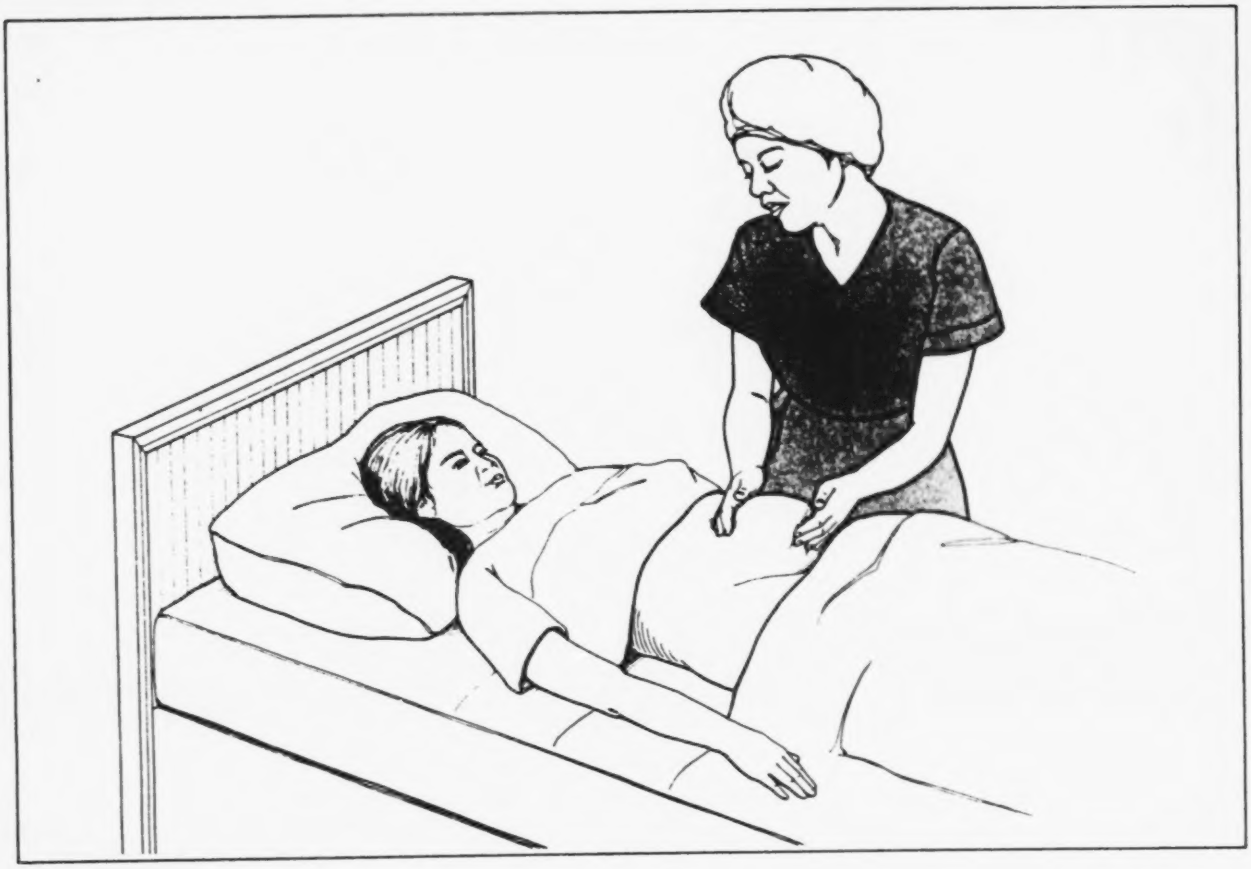
In the 6 to 8 weeks following delivery the reproductive organs of the woman return or nearly return to their prepregnant condition. Again, as in the pregnant woman, the most noticeable and important changes are in the uterus.

Immediately after delivery of the placenta, the uterus normally is very firm and can be palpated about midway between the pubic bone and the umbilicus. It then rises to the level of the umbilicus or slightly higher, where it remains for the first 2 days. Then it decreases in size and gradually descends into the pelvic cavity, at approximately 1 cm per day. By 10 days after delivery, the uterus should be within the pelvis behind the pubic bone where it cannot be felt by abdominal palpations. The uterus is close to the prepregnant size by 5 to 6 weeks. This decrease in uterine size occurs more rapidly in women who have delivered for the first time than in women who have had several babies. It also occurs more rapidly in women who are breastfeeding their infants. This normal process may be delayed if the woman has retained placental fragments or membranes or has an infection. It may also be delayed if the uterus was overdistended by twins or excessive amniotic fluid.

After delivery of the baby and the placenta the outer, spongy layer of the lining of the uterus is shed. It is cast off after delivery in the *lochia.* In the first 3 days this discharge consists mainly of blood and is red in color. After 3 to 4 days the lochia contains fewer red blood cells and more serum, causing it to become paler. After the 10th day it contains more white blood cells and mucus, and the color is a yellowish-white.

The lochia may have a slight reddish tinge for up to 2 weeks. A reddish color lasting more than 2 weeks indicates either retention of parts of the placenta or membranes or lack of healing of the placental site. Bright red blood after the first few days usually means a serious problem such as retained placenta parts. Such cases should be referred for medical treatment. Normal lochia should never contain large pieces of tissue. A foul-smelling discharge may indicate infection and should be investigated.

Palpation of the Uterine Fundus



(From: Ross Laboratories)

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CRITICAL INCIDENT REGARDING CHILDBIRTH

During her training to work as a PCV in maternal and child health, Sally had an opportunity to witness a live birth. She'd never seen the process. The woman had been labor for 12 hours and was about to deliver when Sally was admitted to the room. The room wasn't like Sally had imagined a delivery room to be. There was just a hard table on which the woman lay in her traditional clothes. The cloth that was usually wrapped around for a skirt was loosened to allow the woman to open her legs for childbirth. Unfortunately the birth turned out tobe a breech--the baby was coming out backwards--not head first as is normal. Sally sweated the whole process out--almost feeling all the agnoy and pain that the woman was obviously feeling. Sally felt the woman was very brave for she never made a sound --except one moan for which the midwife scolded her. The midwife seemed very harsh and impatient. She yelled commands to the woman that Sally couldn't understand. She never offered any sympathy or encouragement, but Sally noticed that the woman didn't seem to expect any.

When the baby finally came out, Sally burst into tears. She felt almost as exhausted as the woman looked. The midwife began caring for the baby girl and told the woman to come down from the table. The midwife mentioned that she was lucky to have lived through the many hours of labor. She noted that women who are unfaithful during their pregnancies always have very long and difficult labors. Sally went to help the woman who was crying and looked a bit surprised as she patted her hand and helped her to a rough bed in the next room. Just at that moment the father came in. He brushed past the new mother, without even a endearing glance, and looked at the baby. "I wanted a boy", he said over his shoulder to his wife. Sally suddenly became uncontrollably angry and decided she'd better leave immediately as she was sorely tempted to hit the father.

Session 34

WELL BABY CARE

TOTAL TIME 3 Hours

OVERVIEW

As discussed throughout this training manual, the ability of families and communities to provide adequate medical care, good nutrition and a safe and healthy environment is considered basic to the optimal physical development of children. Also essential is stimulation and socialization during infancy and childhood which contributes to a child's intellectual and emotional development as well as his physical development.

In this session, participants learn to recognize developmental landmarks for children aged up to two years, and to identify ways families contribute to these developmental stages. Local attitudes towards, and treatment of children born with physical deformities are also explored.

Finally, the participants visit or discuss maternal child health clinics to learn how they are organized and what services are offered to children up to two years of age. They also consider how the family and community can promote and augment the services offered by these clinics.

OBJECTIVES

- Describe the characteristics of a healthy newborn and the care it needs.
  (Step 1)
- Explain how the local community views and handles children born with certain physical deformities.
  (Step 1)
- Identify the normal stages of development of children up to two years of age.
  (Step 2)
- Identify the factors which contribute to the physical, intellectual and emotional growth of children up to two years of age.
  (Step 1-5)

RESOURCES

Pediatric Priorities in the Developing World. Chapter 14.
Primary Child Care, A Manual for Health Workers Book 1, Chapters 4 and 26.

Trainer Attachments:

- 34A Items to Observe and Ask Family Members
- 34B The Normal Newborn
- 34C Normal Variations
- 34D Recognition of the High-Risk Neonate
- 34E Care of the Newborn
- 34F Stages in Child Development
- 34G Making Games for Children

MATERIALS

News print, markers, materials to make games and toys (See Trainer Attachment 34G).

PROCEDURE

Trainer Note

One to two weeks prior to this session, invite a nurse-midwife or someone equivalent to explain and discuss the general characteristics and normal variations of the healthy newborn. Ask this person to include a description of abnormalities that are frequently observed in the host country.

At the same time, you should arrange visits with families that will allow the participants to observe and photograph child-rearing practices and behaviors of children up to two years of age. They should be encouraged to take pictures that show children:

- alone
- at play
- interacting with their environment (i.e. mothers, fathers, other family members and friends, animals etc.)
- who are healthy
- who have certain physical abnormalities
- that evoked some emotion in the participants

The participants should also be asked to observe or discuss with family members some of the questions found in Trainer Attachment 34A (Items to Observe and Ask Family Members).

Continued

If time or facilities for developing film are not available, collect photos from Volunteers or staff members that show these behavioral traits.

You should also arrange a visit to a well baby clinic or have the guest invited for Step 1 to discuss the organization and activities that are usually carried out at this clinic.

You should coordinate this session with the participants' cross cultural training and their visits to the Community (Session 12).

Step 1
(30 min)

Assessing and Caring for the Newborn

Introduce this step by telling the participants that in order to help families achieve proper growth and development for their children, it is important to understand how children normally grow and develop. To help familiarize them with the characteristics and variations of the newborn, danger signs in the newborn and the care needed during its first days of life, tell them that a guest speaker will present a brief overview of the appearance and care given the newborn in their host country.

Introduce and welcome the guest and ask the participants to hold their questions until the end of the presentation.

Trainer Note

The items that should be covered and discussed during this step are:

- The general appearance of the normal newborn (ie. head, reflexes of the neck, moro area and grasp)
- Normal variations in the head, eye, breasts, genital area
- Common birth defects and certain danger signs of the neonate
- Common problems (ie.scaly, oily crusts on the scalp, jaundice, irritated skin beneath the diaper)
- Care of the newborn (cord care, providing warmth, breastfeeding)

You will find information about these subjects in Trainer Attachment 34B-E and Primary Child Care by Maurice King. If a guest lecturer is not available to present this step, you or a participant should review the information in these Trainer Attachments and other available resource material and give a brief lecturette using a live baby or doll, and pictures of abnormalities to illustrate these major points.

Continued

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Also, a discussion centered around how the local culture views and treats children with certain abnormalities should be included.

Items for discussion should include:

- Special practices mothers follow after the birth of a child (i.e. changes in eating or work habits)
- Special medications taken, special rituals conducted
- How mothers and/or other relevant persons care for infants (i.e. how are they washed, fed, carried, watched)
- Child care practices that are hazardous to the heatlh of the child
- Types of physical conditions considered to be abnormal or deformed.
- Beliefs concerning the causes of various abnormalities or deformities.
- Treatment (traditional and modern) given for these abnormalities
- Attitudes toward persons deformed or handicapped.

Step 2
(35 min)

Describing Child Development and Growth

Ask participants to work in small groups and to post the pictures they have taken that represent children at various stages of development. Next to the photos, have them list the age of the child and what they observed, tested and asked that led to the determination of the child's age and developmental status.

Ask the groups to visit all the posters and to make notes on the physical, intellectual and emotional stages that were listed for each age group. After the participants have viewed and made notes on the poster, ask them to share their findings and devlop a list of indicators that can be used to assess the different developmental stages.

Trainer Note

Trainer Attachment 34F (Stages in Child Development) contains information on the characteristics of the developmental stages an advantaged child goes through (i.e. one who is given the proper health, nutritional and emotional stimuli). Please refer to this attachment and add to the list anything the participants leave out.

Step 3 (45 min)

Learning Through Playing and Interacting with the Environment

Begin this step with a brief introduction to ways children learn and develop physically, mentally and emotionally (see Trainer Note).

With the help of language trainers, Volunteers and the guest lecturer from Step 1, have the group develop a list of readily available materials that are or can be used to make toys or games. Show them the materials you have collected and ask them to form small working groups and to make one or two toys, pictures, games or collages that will aid a child's development.

Trainer Note

Introduce this step by explaining that changes in the child's behavior and actions (i.e. physical coordination) of the child result from physical development, mental development, and from social-emotional development. These three areas are closely related and integrated.

Good physical growth can be promoted by among other things, parents and family helping children learn and practice physical movements (eye, hand coordination).

Mental growth and development comes about with time and through learning new skills and meanings. New colors, shapes, sounds and tastes which the child experiences help him to learn. The parents and family can help the child by:

- talking to him
- repeating new words or ideas many times
- helping him in problem-solving situations.

Social and emotional growth takes place through the experiences a child has with others.

Tell them that the purpose of this step is to develop simple play materials which can:

- be duplicated by parents
- be used by children alone or in play with their families, and
- encourage the child's physical, mental, emotional and social growth.

Continued

Trainer Attachment 34G gives a list of suggestions for materials and types of toys that participants can make. Obtain some of these materials prior to the session and set up stations where they can work.

Assign each group a different age range up to two years of age for which they should develop toys and games.

15 Minute Break

Step 4
(20 min)

Sharing And Explaining Toys and Games

Ask each group to present their toy or game and to explain:

- The age of the child for whom it was designed
- The develomental purpose it is designed to serve
- The need for or desirability of involving other people (adults, brothers and sisters) in the activity (i.e. guided and free play, the advantages, disadvantages of both.)

After all the groups have completed their presentations ask them what other forms of stimulation, encouragement, disapproval should be given by the family. Have them briefly, with the help of the experienced guests, determine ways that they can work with families in their recognition of the stages of growth and development of a healthy child and how the love, attention and stimulation they provide will help the child grow and develop into a healthy, happy, active adult.

Step 5
(20 min)

Visit To A Well-Baby Clinic

Ask participants if they are familiar with the concept of a Child Health or Under-Fives Clinic and if so to describe its purpose, and the services which such clinics provide.

Discuss the availability of these services in the host country and methods the participants can use to promote their use in the village.

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Trainer Note

Introduce this step by stating that, along with good nutrition, love and attention, a child needs to receive certain kinds of medical care that only a health center can provide. This care, which is focused on in more detail in the modules on Nutrition and Diseases in the Developing World, goes hand in hand with the factors discussed in this session, to ensure the optimal development of individuals.

The objectives and activities that particpnts should list during this discussion of Under-Five Clinics should include services for:

- Immunizations
- Growth Monitoring for prevention of malnutrition
- Treatment for malaria, diarrhea with or without dehydration, and
- Health education for the family

If time permits, the participants should visit an Under-Fives Clinic, if not during this session, then during some other part of their training.

If the guest who presented the introductory lecture can attend the entire session ask him or her to give a brief talk on Under-Fives clinics during this step. The talk should include the organization of the clinics, their activities and the basic medical care that young child needs to grow up healthy.

Step 6
(15 min)

Closure

Ask the participants to summarize this session by defining a Healthy Child and what Well-Baby Care should consist of.

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ITEMS TO OBSERVE AND ASK FAMILY MEMBERS

- how many members of family are there? ages, sexes, educational levels, relationships of the different members to head of family?
- what type of house, compound and farm does the family have?
- what are the conditions of the home and compound?
- what does the family grow? what animals are kept?
- how healthy are the children?
- what materials do the children have for play?
- what specific practices are followed in the family in regard to control of children, discipline, rewards?
- what are the parents' occupations?
- what do the pre-school children do when the parents are working?
- how much time do the mother, father, older children or other relatives spend playing with or encouraging the pre-school children?
- how do the children of different ages behave in the home?
- do the children play with children from neighbouring homes? are they active?
- what do the children like doing best?
- do the children like helping around the house?
- what are the food likes and dislikes of the children? who gives the children their various meals? who do they eat with? what do they eat?
- what language is spoken at home?
- do the children take part in any community activities?
- other relevant questions according to the country and culture

(From: Ritchie, J., Manual on Child Development Family Life Nutrition. pp. 144-145.)

14. The Normal Newborn

Everyone responsible for the care of mothers and infants should be familiar with the characteristics of the newborn. They should also be aware of the common variations in appearance that may concern parents, but that are considered normal. It is important to be able to differentiate between normal variations and those that require referral for specialized care.

General Appearance

The typical newborn appears to have a large head, which may be rounded, lopsided, or elongated. The infant may have a bald head or thick hair. The face seems small, with pudgy cheeks, a wide, flat nose, and a receding chin that quivers easily. The neck is short and has deep wrinkles. The newborn has a small chest, large rounded abdomen and small pelvis. The short legs are somewhat bowed and the knees usually are flexed, with the legs drawn up toward his body. The arms are flexed, and the hands are held in a tight-fisted position.

Fair-skinned infants are rosy-red at birth, while dark-skinned infants are much lighter at birth than they will be later in life. A newborn infant's skin is thin and dry. Some infants have downy hair on their bodies. At birth, the baby is covered with varying amounts of a white, cheesy, cold-cream-like substance called *vernix*. Cracking and peeling of skin is common in the first days of life.

The newborn weighs an average of 3400 g. A baby born weighing less than 2500 g is considered a low-birth-weight infant. Birth weight over 4080 g is considered excessive. The average length of the newborn is 50 to 52 cm.

The Head

The newborn's head is proportionately large, about one-fourth the total body length. It measures between 32.1 cm and 36.4 cm when measured around the fullest part. Usually, the head circumference is 2 cm greater than the chest measurement.

The *fontanels* are openings or spaces between the skull bones. The diamond-shaped anterior fontanel is on top of the head where the two parietal bones of the skull come together. The anterior fontanel measures approximately 2 to 3 cm wide and 3 to 4 cm long. Commonly referred to as the "soft spot," the anterior fontanel can be felt easily. It should not be sunken or bulging. The anterior fontanel normally closes at 12 to 18 months of age.

The posterior fontanel is triangular in shape. It is located at the back of the head, between the occipital and parietal bones. The posterior fontanel is much smaller than the anterior fontanel; it may be so small that it is not felt easily. It usually closes by the end of the 2nd month.

The bones of the skull are held together loosely by membranes at the suture lines. This allows for considerable movement of the skull bones during labor and delivery. As the head passes through the birth canal, the bones overlap at the sutures, making the head smaller. This overriding of the sutures may persist for a brief interval after delivery. This is a normal occurrence and disappears within a few days. Widened sutures or fontanels, however, are abnormal findings.

Newborn Reflexes

The positions a newborn assumes and its responses to stimuli are important indications of stage of development and physical condition.

The normal full-term newborn lies with both arms and legs flexed. If an examiner straightens an arm or leg, it will return to a flexed position when released. Diminished muscle tone is found in immature infants and those who suffered from lack of oxygen before birth.

Tonic Neck Reflex

When the head is turned toward one side, the infant extends the arm and leg on that side and flexes the arm and leg on the opposite side. This tendency usually disappears by 2 to 4 months of age. Its absence in the newborn or its persistence beyond 4 months of age may indicate damage to the central nervous system. Such damage could be the result of birth injuries or severe infection.

Moro Reflex

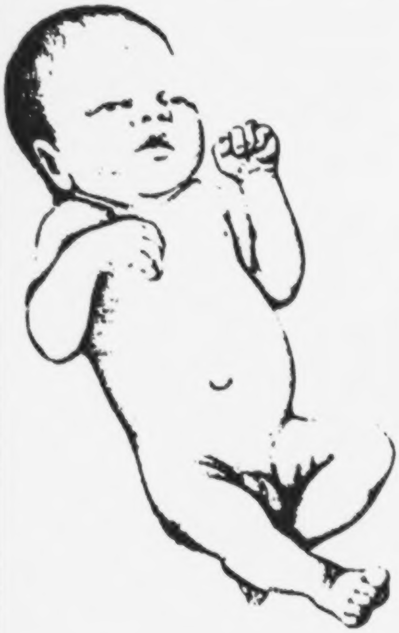
This reflex is best demonstrated when the infant is held with one hand under the buttocks and the other hand supporting the upper back and head. The infant's head is allowed to drop slightly. This sudden change in position will cause the infant to stiffen the body, draw the legs up, and throw the arms up and out. The infant then brings the arms forward toward each other. The thumb and index finger curve toward each other until they almost touch, while the other fingers extend. The movements should be symmetrical. Movement of only one arm indicates the possibility of a fractured bone or damage to a nerve.

The Moro reflex normally is strongest for the first 2 months of life and disappears after 3 to 4 months. Its absence in the newborn period indicates some damage or irritation to the nervous system. Infants who do not demonstrate the Moro reflex should be referred for medical evaluation and treatment.

Grasp Reflex

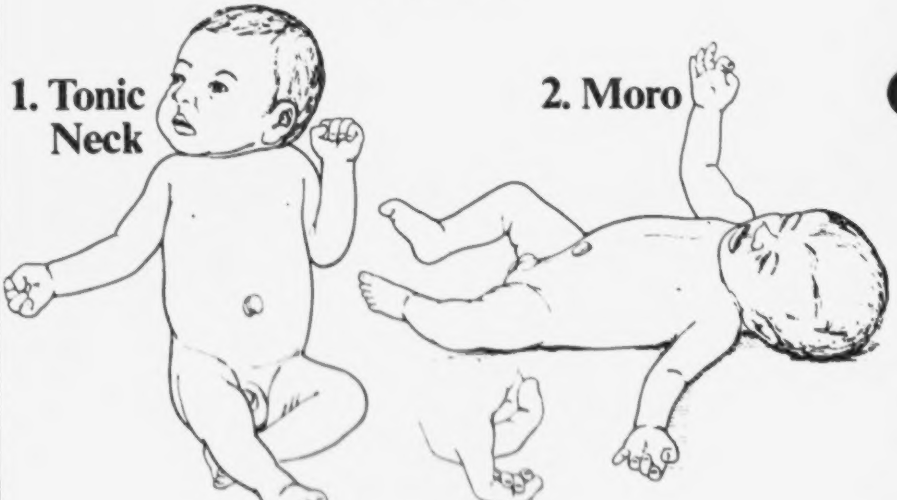
The grasp reflex should be present in both hands and feet. When an examiner places a finger across the palms of the infant's hand near the fingers, the infant flexes the fingers and grasps the examiner's finger. In the normal full-term newborn, the grasp is strong enough to support the baby's weight. Touching the soles of the feet makes the infant flex the toes. The grasp reflex lessens after 3 months and begins to be replaced by purposeful movement.

14. The Normal Newborn



Typical Posture

Reflexes


1. Tonic Neck
2. Moro
3. Grasp

(From: Ross Laboratories.)

15. Normal Variations

Some healthy newborns have normal but unusual physical characteristics. These may concern parents or other family members, who may be unfamiliar with how the newborn should look. The knowledgeable nurse or midwife can reassure the family that the baby is normal.

Molding

The newborn's head may be molded into an elongated shape, especially if labor was prolonged or difficult. Molding usually recedes rapidly; it is much improved within 24 to 48 hours of birth. At the end of the 1st week, the head usually assumes a normal shape. Asymmetry of the face may also result from pressure or the position in the uterus. This, too, usually corrects itself.

Caput Succedaneum

At birth, the soft tissues over the portion of the head that was presenting may be swollen. The edema results from pressure of the head on the cervix. The size of the swelling varies. The swelling rapidly diminishes, and the fluid is usually completely absorbed within a few days.

Cephalhematoma

A cephalhematoma is a collection of blood between the cranial bone and the periosteum. It is caused by pressure of the fetal head against the pelvis during prolonged or difficult labor. Like the caput succedaneum, cephalhematoma appears as a soft swelling. Although a cephalhematoma may be noticed at birth, it may not be apparent until the 2nd or 3rd day of life. The most common site is over the parietal bone.

A cephalhematoma never extends over a suture line because it is limited to the surface of a bone. It may therefore be distinguished from a caput, which involves soft tissues of the scalp and therefore has no such limitation. *However*, a cephalhematoma may involve more than one cranial bone.

A cephalhematoma disappears without treatment, although it may take several weeks. The collection of blood should be protected from injury but needs no further care. Aspiration should be avoided because of the danger of introducing infection.

Subjunctival Hemorrhage

Occasionally, as a result of pressure during delivery, a small capillary in the infant's sclera (white covering of the eyeball) breaks. The resulting bleeding appears as a bright-red, usually crescent-shaped spot on the sclera. No treatment is required. Parents may be reassured that the blood will be absorbed and cause no harm.

Enlargement of Breasts

Noticeable enlargement of the breasts often is seen in newborn infants of both sexes. Occasionally the breasts secrete a thin, watery fluid. These conditions are produced by the mother's hormones acting on the infant. The breast variations disappear gradually as the mother's hormones are excreted by the infant. The breasts should not be massaged, squeezed, or aspirated.

Genital Hypertrophy

Other effects of maternal hormones on the newborn's appearance include a swollen vulva and a white, possibly blood-tinged mucoid vaginal discharge. Parents need to be reassured that this is a normal finding in some female infants and will soon disappear.

Mongolian Spots

Mongolian spots are irregular areas of bluish or grayish pigmentation. They are seen most often over the lumbar or sacral area in infants of Asian, African, or Mediterranean peoples. These spots closely resemble bruises, although they are harmless and usually disappear by age 4 to 6 years.

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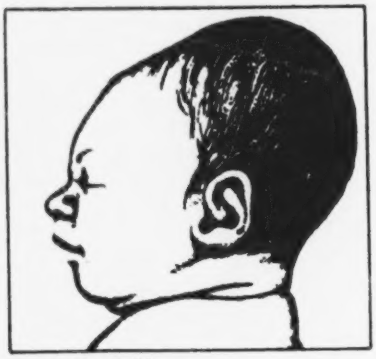
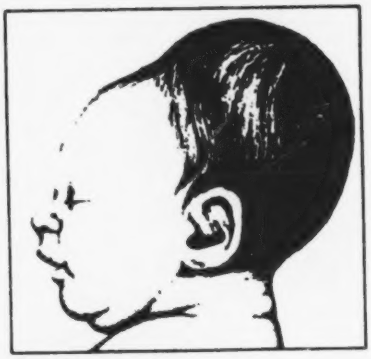
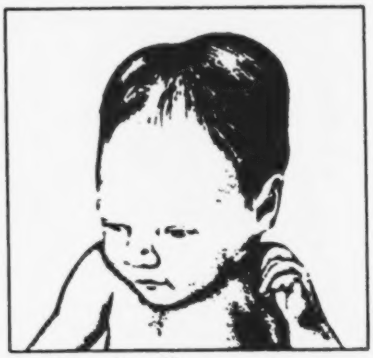
15. Normal Variations of the Newborn



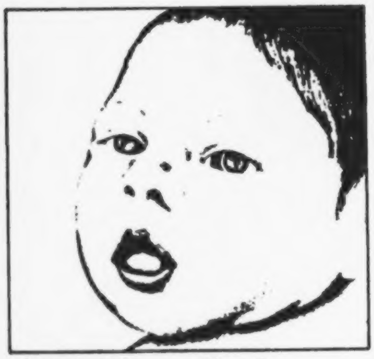
1. Molding



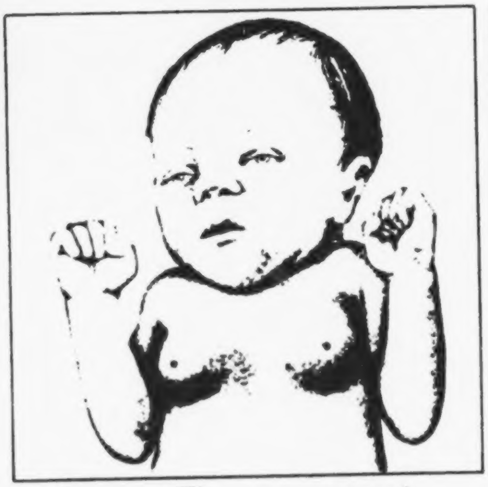
2. Caput Succedaneum



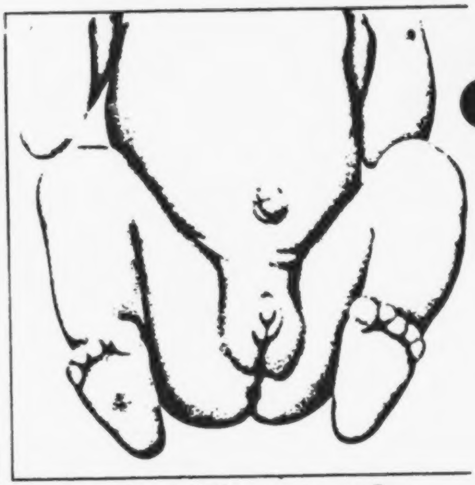
3. Cephalhematoma



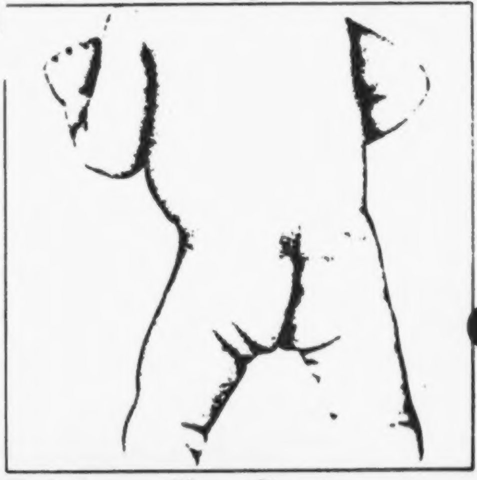
4. Subjunctival Hemorrhage



5. Breast Engorgement



6. Genital Hypertrophy



7. Mongolian Spots

(From: Ross Laboratories.)

16. Recognition of the High-Risk Neonate

Danger Signs in Newborn

- Cyanosis
- Rapid or difficult respirations
- Low birth weight
- Jaundice
- Abdominal distention
- Tense fontanel
- Odor or discharge from cord
- Bleeding from cord
- Excessive or diminished muscle tone
- Rapid, slow, or irregular pulse
- Sweating
- Edema (swelling)
- High or low body temperature
- Pallor
- Petechiae (round, purple-red spots on skin)
- Excessive salivation, frothy mucus
- Vomiting of bile
- Diarrhea
- Abnormal cry
- Cough
- Excessive irritability
- Twitching
- Convulsions
- Paralysis
- Delayed or inadequate voiding (beyond 24 hours)
- Failure to pass meconium within 48 hours
- Change in behavior or appearance
- Failure to take feeds, failure to suck well

The high-risk newborn is one who, because of conditions prenatally, postnatally, or during the birth process, requires special care in order to survive and develop as a healthy individual. The nurse or midwife should be aware of the prenatal conditions that make the birth of a high-risk infant likely, as well as the signs that indicate a newborn might be in trouble.

Certain prenatal conditions present greater than usual hazards for both the mother and infant. Women with these conditions should be referred for delivery in a hospital, if possible. This group includes women who:

- Are very young
- Are very short or have skeletal deformities
- Are diabetic
- Are malnourished and/or anemic
- Have or have had rubella, malaria, herpes, syphilis, or tuberculosis
- Have had toxemia of pregnancy or bleeding in late pregnancy
- Have polyhydramnios (excessive amount of amniotic fluid)
- Have a fetus in an abnormal position

Conditions during labor and delivery that suggest the possibility of an infant at high risk include the following:

- Prolapsed cord or cord around the neck
- Meconium-stained amniotic fluid during labor
- Obstructed or prolonged labor

A history of any of the above conditions alerts the midwife to the possibility of a newborn at high risk. However, every newborn should be carefully examined immediately after birth and closely observed thereafter for any sign of difficulty in making a successful transition to extrauterine life.

At birth, the infant moves from an environment where basic needs are met to the outside world. Here the infant must be able to meet his or her own needs for oxygenation, nutrition, and elimination. A life-threatening problem exists when the infant is unable to manage any of these essential body functions. The nurse or midwife must be alert to signs that the newborn might have difficulty meeting these needs.

Cyanosis

Cyanosis is the bluish tone to the skin due to a low level of oxygen in the superficial blood vessels. Because the peripheral circulation is immature, the normal newborn frequently has some localized cyanosis in the lips, hands, and feet in the first few hours after birth. *Generalized* cyanosis, however, is a cause for concern, because it means that the infant's body cells are not obtaining adequate quantities of oxygen.

Because even slight cyanosis is significant, close observation for its presence is important. Comparison of the infant with another newborn of obviously good color helps reveal any difference. In babies with dark skin, cyanosis can be observed best in the mucosal lining of the mouth.

Cyanosis may be caused by any condition that lowers the level of oxygen carried by hemoglobin in the blood. Common causes include respiratory problems that prevent normal air exchange, damage to the central nervous system, or cardiac anomalies.

Sudden episodes of cyanosis in a newborn whose color has previously been normal may be caused by excessive amounts of thick mucus obstructing the upper respiratory tract. Suctioning of both nose and mouth can relieve this problem. The infant will then regain his normal color.

The cyanotic infant who also has irregular breathing, a high-pitched cry, absence of the Moro reflex, or muscle tone that is either rigid or lax may have damage to the central nervous system. Infants whose cyanosis becomes more severe when they cry may have congenital heart anomalies. Cyanosis also occurs in babies with choanal atresia (occlusion of the back of the nose by bone or membrane). Because infants normally breathe through the nose, and can breathe through the mouth only with great difficulty, infants with this condition will require surgery. An infant who is cyanotic at birth or immediately afterward and remains persistently cyanotic after suctioning has a more serious problem that needs to be investigated and treated.

Sternal Retraction and Respiratory Distress

Sternal or chest retraction is the pulling in of the chest that results from an increased effort to breathe. In the normal healthy newborn, respiratory movements are carried out mainly by the diaphragm and abdominal muscles, with little movement of the chest. When expansion of the lungs meets with resistance for any reason, the infant raises the ribs in an attempt to increase the size of the chest cavity. Because of the increased negative pressure in the chest, the softest parts of the infant's pliable chest are pulled inward. The result is retraction of the spaces between the ribs, the areas immediately above and below the sternum itself, and the sternum.

Chest retraction may range from mild to severe. In severe cases, the infant may have seesaw breathing. This means that the abdomen rises and the chest sinks on inspiration, and the chest expands and the abdomen falls on expiration. Because one of the first and most essential tasks of the newborn is to establish breathing, respiratory distress is life-threatening.

Another sign of respiratory distress often seen with sternal retraction is flaring of the nostrils on inspiration. The infant attempts to obtain more oxygen by widening the nasal passages. Flaring of the nostrils frequently alternates with expiratory grunts. The infant attempts to retain air in the lungs by partially closing off the glottis, and a grunting, moaning, or sighing sound is made as the air moves out past the vocal cords. The sound of a grunt or moan each time the infant breathes out should alert the nurse or midwife that the infant is in distress. If breathing is severely labored, the lips may part as the chin is pulled down when the infant takes a breath.

Other signs of respiratory distress are a respiratory rate greater than 60 per minute or a heart rate less than 100 or greater than 160 per minute. Cyanosis may or may not be present.

Usually, an infant in respiratory distress has one or more of these abnormal signs. The infant probably will be either restless or unusually quiet and less active than a healthy newborn. A baby in respiratory distress usually does not hold the extremities in a normal, flexed position but is limp, and the legs fall into a froglike position. An infant in respiratory distress does not suck well. During feeding, the baby may have to stop sucking frequently to catch a breath.

Respiratory distress is caused by any condition that results in incomplete expansion of the lungs. For example, the air passages may be obstructed by aspiration of mucus, meconium, amniotic fluid, or blood. Respiratory distress may be caused by congenital defects, infection, pneumonia, heart failure, hemolytic diseases, metabolic diseases, or intracranial hemorrhage. Perhaps the most common cause is lack of a substance called *surfactant*, which is normally found in the lungs. Without adequate amounts of this substance, the alveoli of the lungs collapse each time the infant breathes out, and increased effort is required to expand them with each breath.

Because immaturity is a common cause of this problem, infants born before their due date should be closely observed. Any other infant who, for any reason, suffers from lack of adequate oxygen before birth is also susceptible. Infants of mothers who are diabetic, who have heart conditions, or who had toxemia or bleeding during pregnancy are at risk. Prolonged labor, prolapsed cord, cord around the neck, placenta previa, premature separation of the placenta, or trauma at birth can be contributing causes. Whatever the cause, an infant who displays signs of respiratory distress needs skilled medical and nursing care in a well-equipped facility as soon as possible.

If at all possible, pregnant women with conditions that increase the probability of delivering an infant who might develop respiratory distress should plan to deliver at a hospital. Nurses and midwives can assist in the prevention of respiratory distress by encouraging and providing prenatal care and carefully managing labor and delivery.

Low-Birth-Weight or Immature Infant

The infant who is smaller or weighs less than normal at birth needs special care. Traditionally, a low-birth-weight infant was considered to be one weighing less than 2500 g. With the recent recognition that babies in many countries are typically lighter in weight than newborns in western nations, some countries have now set the lower limits of normal birth weight at 2250 g or even 2000 g.

The largest number of immature infants are those who are born before the expected due date. The infant born before term appears not only small but underdeveloped. The nurse or midwife should develop skill in evaluating the maturity of an infant by physical findings other than weight or size alone.

The head of the low-birth-weight infant appears even larger in proportion to the body than in the normal newborn. Compared with the skin of the full-term newborn the skin is a deeper pink, and cyanosis of the hands and feet is more likely. The blood vessels can be seen easily through the smooth, thin skin. Fine, downy hair, called *lanugo*, often is seen not only on the back but also on the arms, forehead, and sides of the face.

Breast tissue is less developed, and the nipple is less well defined. Creases in the soles of the feet are fewer; they may be entirely absent if the infant is born before 32 weeks of gestation. Ear cartilage is scant, so the ears appear rather flat and shapeless. In the male, the testes frequently have not descended into the scrotum. In the female, the underdeveloped labia majora does not cover the clitoris and labia minora.

Muscle tone is poor. The low-birth-weight infant lies in a relaxed, froglike position, rather than in the flexed position of the full-term newborn. Because of incompletely developed muscles, the abdomen distends easily and the movements of the intestines can be seen through the thin abdominal wall. Sternal retraction accompanied by nasal flaring is frequently seen, since the immature infant is prone to respiratory difficulties. The reflexes are weak or even absent, depending on the degree of immaturity.

The immature infant has the same priority needs as the full-term infant. Immature lungs and poorly developed respiratory muscles make it more difficult for the immature infant to breathe on his own. A weak gag reflex makes it difficult to cope with the typically large amounts of mucus. Maintaining body heat is difficult because of the relatively large area of body surface, lack of subcutaneous fat, and inability to shiver. Nutrition is a problem because of the low-birth-weight infant's high caloric needs coupled with the poor sucking reflex and small stomach. The skin is easily traumatized. Finally, the immature infant has a poorly developed ability to combat infections.

Because the immature infant's own resources are limited, survival is often dependent upon expert care. If the birth of a preterm or immature infant is expected, the mother should deliver in a hospital, where the infant can receive skilled care immediately. An immature infant born in a home or a clinic with limited facilities should be transferred as soon as possible to a well-equipped medical facility. Meanwhile, the nurse or midwife should insure that the baby is handled gently, suctioned well, and kept warm.

Jaundice

A yellow tone to the skin, sclera, and nails is called jaundice. It occurs when bilirubin levels in the blood become excessive, and pigments stain the body tissues. Bilirubin, which results from the breakdown of red blood cells, is normally excreted by the body. The newborn has high levels of bilirubin and a poorly developed mechanism for converting it to a form that can be excreted.

The nurse or midwife should observe every newborn for jaundice. Jaundice is most reliably assessed by observing the color of the sclera, nails, and skin, especially the palms and soles. Application of pressure over a bony area causes blanching, and the yellow color can be seen more easily. For dark-skinned infants, observation of the sclera, conjunctiva, and oral mucosa is best, because the normal pigment in the skin can easily mask jaundice. Infants should be observed in daylight, as various types of artificial light may distort the color.

A slight degree of jaundice is observed in the skin and sclera of about half of all full-term infants, beginning on the 2nd day of life and disappearing by 1 week. This common condition is called physiologic jaundice of the newborn. It is important to distinguish between this mild jaundice, which apparently is not harmful, and the more serious forms. Physiologic jaundice never appears in the first 24 hours of life; nor does it last longer than 1 week in the full-term infant or 2 weeks in the preterm infant. With this type of jaundice, the infant shows no other signs of illness. Also, bilirubin levels in the blood do not reach excessively high levels. If total serum bilirubin exceeds 12 mg/100 ml, if the jaundice is present at birth, if it appears sooner than the 2nd day or lasts longer than 1 week, or if the infant has other signs of illness, the cause needs to be investigated.

Common causes of jaundice are immaturity, hemolytic diseases caused by blood group or Rh incompatibility, and infections. Infants born to diabetic mothers are at increased risk for jaundice. Other high-risk infants include those with enclosed bleeding, such as a cephalhematoma, central nervous system bleeding, or considerable bruising from delivery.

Whenever possible, the precise level of bilirubin in the blood should be determined in any infant with jaundice. Excessive levels of bilirubin, whatever the cause, can be dangerous. When bilirubin levels are high, bilirubin pigments are deposited not only in the skin but also in the tissues of the brain, resulting in brain damage. This is called kernicterus. Early signs of excessive levels of bilirubin are poor feeding, lethargy, and loss of the Moro reflex. If untreated, the infant may have a shrill cry, respiratory distress, bulging fontanel, twitching, spasms, or opisthotonos (abnormally increased muscle tone). Infants with these symptoms often die and those who do survive are seriously damaged for life.

Low-birth-weight infants and those with infections or respiratory distress may develop kernicterus at lower levels of bilirubin.

Abdominal Distention

The nurse or midwife should be able to distinguish between the normal, rounded, protuberant abdomen of the newborn and an abnormally distended abdomen. The distended abdomen is firmer to the touch and may appear shiny because the skin is stretched. If the distention is severe, engorged blood vessels may be seen.

Abdominal distention in the newborn period may be caused by various conditions, all of which are serious. A common cause is an obstruction somewhere in the gastrointestinal tract. An infant with such an obstruction cannot survive, so the problem must be recognized and treated early. Any time a newborn is vomiting and/or has not passed meconium, the possibility of an obstruction should be considered. Another possible cause of distention is a fistula (abnormal opening) between the trachea and the stomach. This causes the stomach to become distended with air. Infants with this type of fistula also frequently have excessive amounts of mucus.

Abdominal distention also may be caused by septicemia, a generalized infection in the blood stream. Infants with septicemia are lethargic, feed poorly, and may be jaundiced or cyanotic. Any infant with abdominal distention needs skilled medical care at the earliest possible moment.

Tense Fontanel

Normally, the anterior fontanelle in the fontanel may be felt on a level with the cranial bones. It is firm but soft to the touch. Coughing or crying may make it more taut or cause it to bulge slightly, but the fontanel again flattens as the infant becomes quiet. The anterior fontanel also is softer and becomes flatter when the infant is held in an upright position. Anytime the fontanel feels *very* firm to the touch and continues to bulge above the level of the cranial bones, it is a serious sign of increased pressure on the brain.

Some of the more common causes of tense fontanel are intracranial hemorrhage (bleeding into the brain tissue), subdural hematoma (a collection of blood under the covering of the brain), or severe infections such as meningitis (infection of the covering of the brain). These are all serious, life-threatening conditions. An infant with tense fontanel is in urgent need of medical treatment.

The nurse or midwife should be alert to the tension of the fontanel of any newborn infant. Infants in whom a problem is likely often have other signs of abnormalities, such as refusal of feeds, diminished muscle tone, or increased respiratory rate.

Inflammation of the Umbilical Cord Region

The umbilical cord at birth is bluish white and moist. After it is clamped, it begins to dry and shrink and becomes a dull yellowish brown. If free of infection, it continues to shrink and turn black. A red line of demarcation appears where the cord attaches to the skin of the abdomen. By the 6th to 10th day, the cord is completely dry and falls off.

Any redness in the area, odor, moisture, or discharge from the cord indicates an infection, which needs to be treated promptly. Inflammation in the umbilical region is a serious problem. Infection can easily spread to the liver or even to the blood stream, resulting in septicemia.

With proper care, infection can be prevented. Only sterile scissors or razor blades should be used to cut the cord. The cord should be cut no more than 2 to 3 fingerbreadths from the abdomen; a long cord stump makes infection more likely. If alcohol, triple dye, or another antiseptic is available, it may be used to clean the cord. According to some local customs, substances other than antiseptics are put on the cord. This practice should be strongly discouraged, because such substances may contain bacteria that can cause tetanus or local infection around the umbilicus.

A cord dressing is not necessary. If one is used, it should be loose to permit air to circulate freely so the cord will dry. Creams, lotions, and oils should be avoided, as they delay drying of the cord and increase the possibility of infection. The area should be kept clean and dry. Until the cord heals, the infant should be given sponge baths rather than bathed in a basin or tub. Whenever caring for the cord, the nurse, midwife, or parent should wash her or his hands thoroughly. Careful handwashing helps prevent infection.

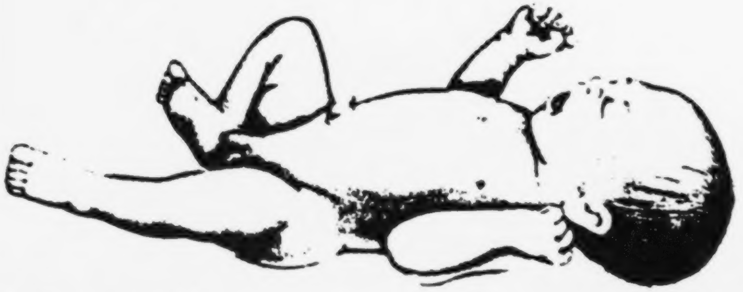
Opisthotonos

Increased muscle tone beyond that normally found in a full-term newborn is a dangerous sign, just as is diminished muscle tone. The healthy newborn lies with the body and extremities bent (flexed). If an examiner stretches the extremities, the infant will flex them when they are released.

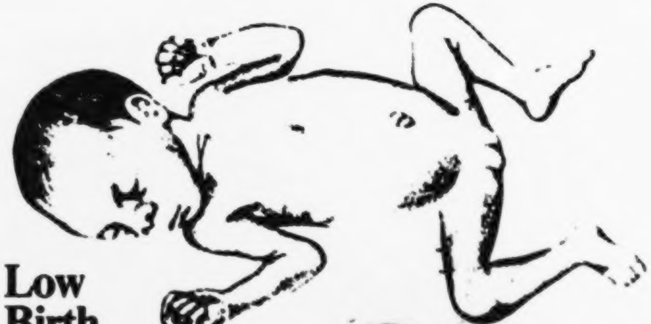
Conditions that cause irritation to the meninges (the covering of the brain) can make all the muscles of the body contract. As a result, the infant's body assumes an extended rather than a flexed position. The head is drawn back, the back is arched, and the body is stiff or rigid. This condition is often accompanied by muscle spasms or convulsions.

The infant who displays such symptoms is extremely ill and should be referred to a physician immediately.

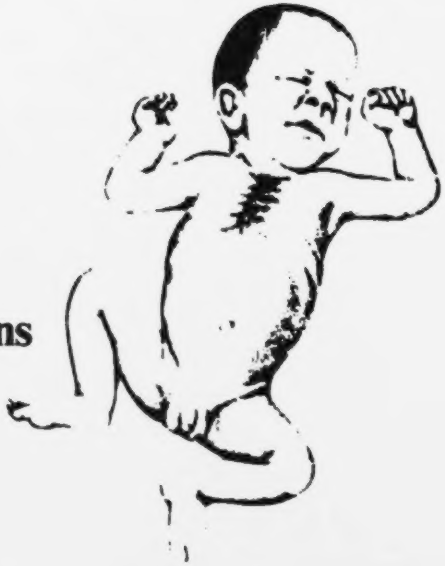
16. High Risk Infants



1. Cyanosis



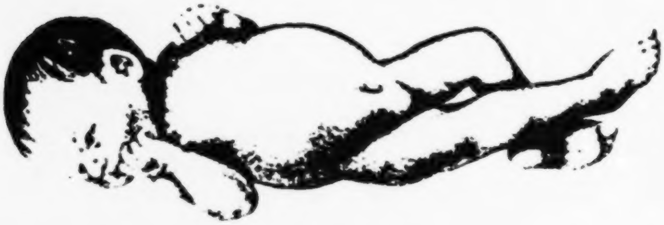
2. Low Birth Weight



3. Sternal Retractions

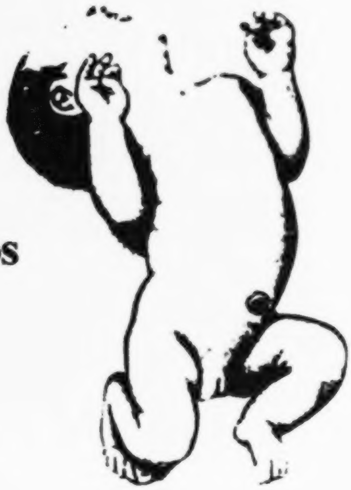
4. Jaundice

High Risk Infants

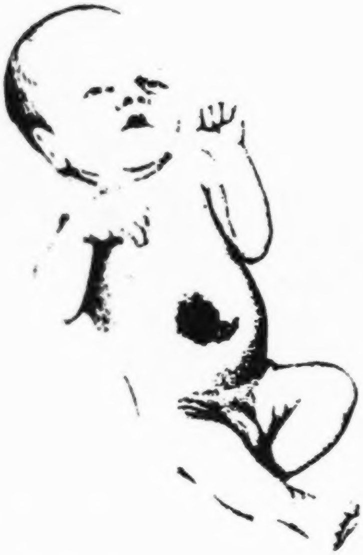


5. Abdominal Distention

6. Tense Fontanel



7. Opisthotonos



8. Inflammation of Umbilical Cord

(From: Ross Laboratories.)

11. Care of the Newborn

Several important needs of the newborn must be met. They are:

- To begin breathing on his own
- To maintain body temperature
- To be free from infection
- To be adequately nourished

The midwife's care of the newborn is directed toward meeting these needs.

Clearing the Airway

In order to breathe, the infant must have a clear passageway for the air. Immediately after delivery the infant is held securely with the head down while the nose and mouth are wiped free of mucus and blood. A bulb suction or mucus extractor should be used if available.

Cord Care

After the airway has been cleared, the cord is clamped or tied in two places and cut between the ties with sterile scissors or razor blade. The cord is then clamped or tied approximately 1 to 2 fingerbreadths from the abdomen using a sterile clamp or tie. If a string or thread is used, it should be tied in a square knot so it cannot come loose and allow bleeding. The cord is then painted with alcohol, triple dye, or some other antiseptic. A cord dressing is not necessary, but if one is desired, a sterile gauze square may be placed loosely over the cord stump. Infection of the stump must be prevented because the infection can spread easily to the infant's body. Only sterile instruments should be used to cut and clamp the cord. The area should be kept clean and dry until the cord stump heals.

Eye Care

To protect the newborn from eye infection, silver nitrate drops or an antibiotic eye ointment is instilled in the eyes immediately after birth. The midwife should use the substance specified by law or official policy. In the absence of a policy or law, the midwife should consider it her responsibility to use the best substance she has available. The infant's eyes should be wiped with a clean piece of cotton. Holding the head securely, the midwife places the drops or ointment in inside the lower eyelid. The drops or ointment should never be placed directly on the eyeball.

Providing Warmth

Because of physical immaturity, the newborn infant is not able to maintain a normal body temperature when the surrounding air is too hot or too cold. At birth the infant leaves the warm, controlled environment of the uterus and enters what is almost always a much cooler room. Evaporation of moisture from the newborn's wet body lowers body temperature. The infant can easily become chilled in the first few minutes after birth.

Cooling of the body increases the infant's use of oxygen and quickly leads to a disturbance in the body's chemical balance. This is especially dangerous in an infant who already is having difficulty breathing. Therefore, the midwife must take every precaution to prevent excessive heat loss. Immediately after the cord is cut, the infant should be dried well with a sterile or very clean blanket or towel.

In most areas of the world the newborn needs to be kept warm. A crib with a radiant heat source or controlled temperature is the ideal way to provide warmth. If this is not available the infant should be well wrapped in a blanket. *CAUTION!!*–In some climates, the infant will become too hot if wrapped. The midwife should use her own judgment in determining whether the infant needs to be covered.

Breast-Feeding

Breast-feeding immediately after birth should be encouraged when the infant is breathing well and the mother is awake, alert, and wants to nurse. The infant's sucking stimulates the uterus to contract after the placenta is delivered. This decreases blood loss in the mother.

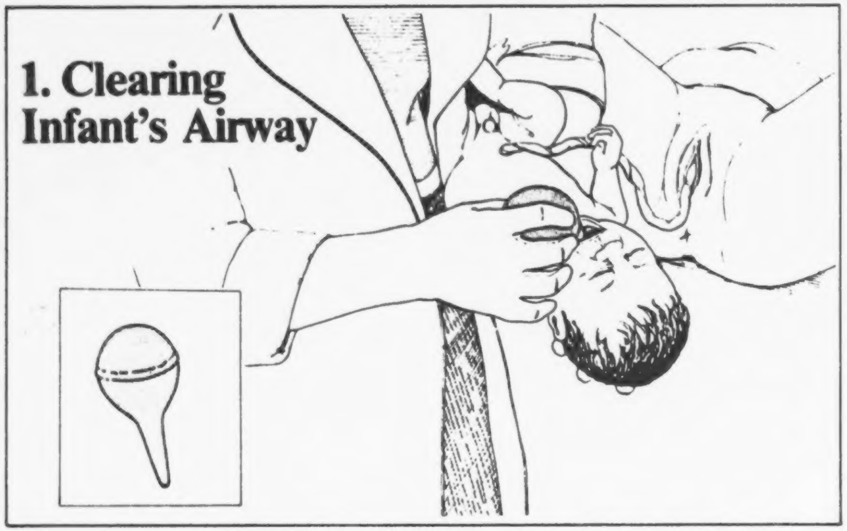
Early breast-feeding also provides close contact between the mother and her newborn and promotes the development of a close relationship between them. If this is her first baby or if she has not previously breast-fed, the nurse needs to give her assistance or guidance.

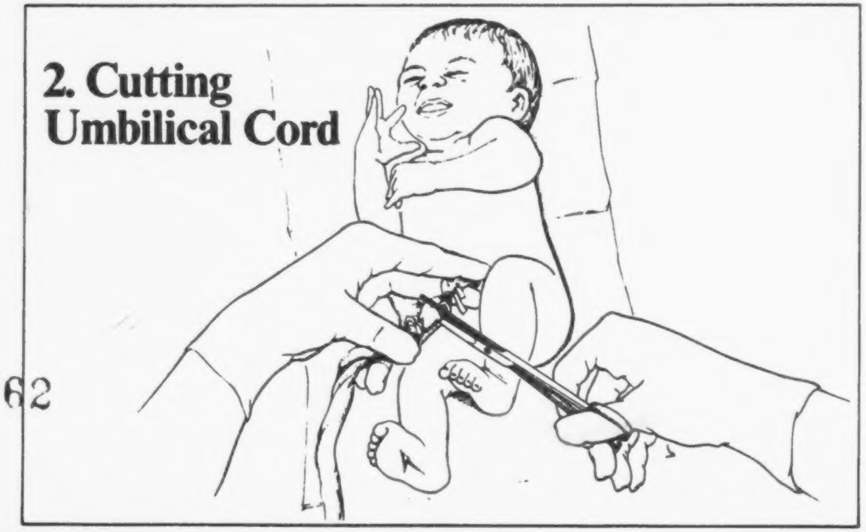
The mother probably can manage best if she is lying flat with a pillow under her. She cradles the infant's head with one arm. With her free hand, she touches her nipple to the side of the baby's face that is nearest to the breast. This encourages the baby to turn toward the nipple (the rooting reflex). The mother places the nipple well into the baby's mouth. The baby's gums should press on the areola rather than on the nipple itself. The mother may need to place fingers against the breast to keep it away from the baby's nose. To remove the infant from the breast the mother should place one finger at the corner of the infant's mouth. This breaks the suction, helping to prevent sore nipples.

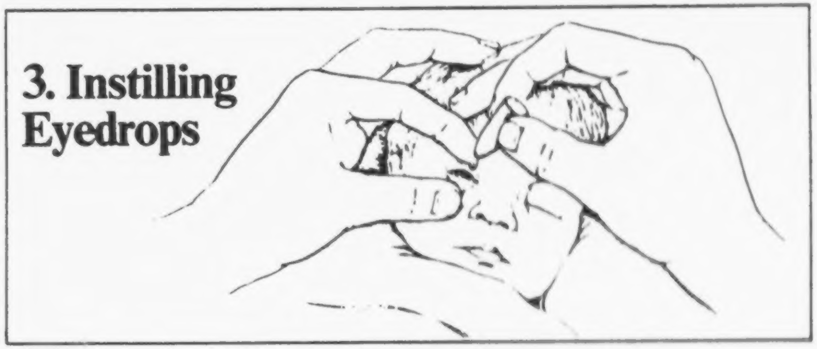
Both breasts should be offered because the sucking promotes the production of milk. If the infant takes little or does not seem eager, it is not a cause for concern. The infant has enough body stores of nutrients to stay healthy until the milk flow is established. In the meantime, he is receiving colostrum that contains not only nutrients but also antibodies that help to keep him healthy.

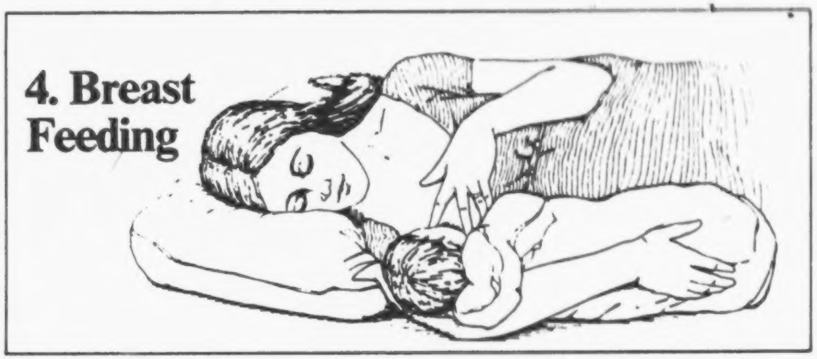
After the mother has had an opportunity to see and touch the baby and breast-feed if she desires, the infant should be placed in a crib on his right side with the head slightly lower than his body. This will help any mucus to drain from his mouth.

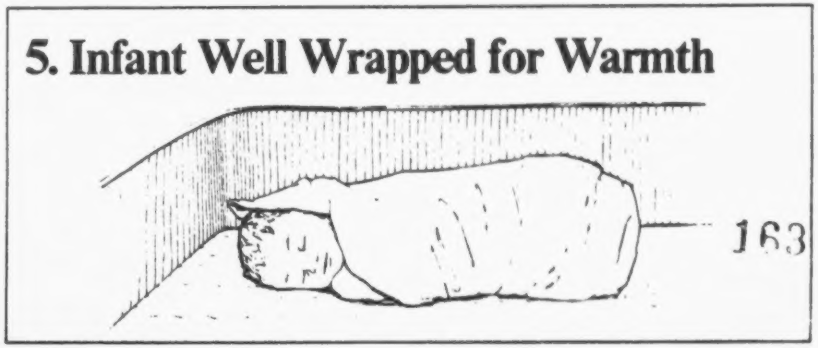
11. Immediate Care of the Newborn


1. Clearing Infant's Airway


2. Cutting Umbilical Cord


3. Instilling Eyedrops


4. Breast Feeding


5. Infant Well Wrapped for Warmth

ANSWERS TO REVIEW QUESTIONS
Common Problems of the Newborn

1. What causes cradle cap?

   Oils from the scalp

2. Describe the usual signs of cradle cap.

   Scaly, oily crusts on the newborn's scalp

3. How would you treat cradle cap?

   Remove the scaly patches by using a soft brush to scrub the newborn's head with soap and water. Apply 2.5% selenium sulfide lotion and rub it into the newborn's scalp with warm water. Leave the lotion on the scalp for fifteen minutes, then rinse it completely off. Repeat the treatment twice a week for two weeks, then once a week for the next two months. Advise the mother to protect her newborn's eyes and to take care that her newborn does not swallow any of the lotion.

4. Diaper rash is a skin problem that is caused by irritation from urine and stool in diapers.

   a. Describe the usual medical history.

   Redness and irritation beneath the diaper

   b. Describe what signs of diaper rash you should look for in a physical examination.

   Red, chafed, and moist skin beneath the diaper

   c. What will be your patient care for diaper rash?

   Tell the mother to change the diaper soon after it gets dirty or wet.

   Wash the diaper area with a soft, soapy cloth, and rinse with clean water.

   Expose the affected area to the air for several hours each day.

5. TRUE(T) or FALSE(F)

T A cold in a newborn is usually caused by a virus.
F You will need antibiotics to treat a cold.
T The symptoms of a cold usually last from three to ten days.
T One possible complication of a cold is that the infection may spread to the larynx and epiglottis.

6. List at least five signs that you might find when examining a newborn with a cold.

a. Normal temperature
b. Active and alert but perhaps irritable newborn
c. Possible noisy nasal breathing at times
d. No appearance of severe illness
e. Clear discharge from nose
f. Clear lungs

7. Describe what patient care you would suggest for a newborn with a cold.

a. Clear his nose with a rubber syringe so he can nurse.
b. Continue to breast-feed frequently.
c. Give .25% neosynephrine nose drops two to three times a day before feeding.

8. What causes simple swelling of a newborn's scalp?

Pressure on the newborn's head during delivery

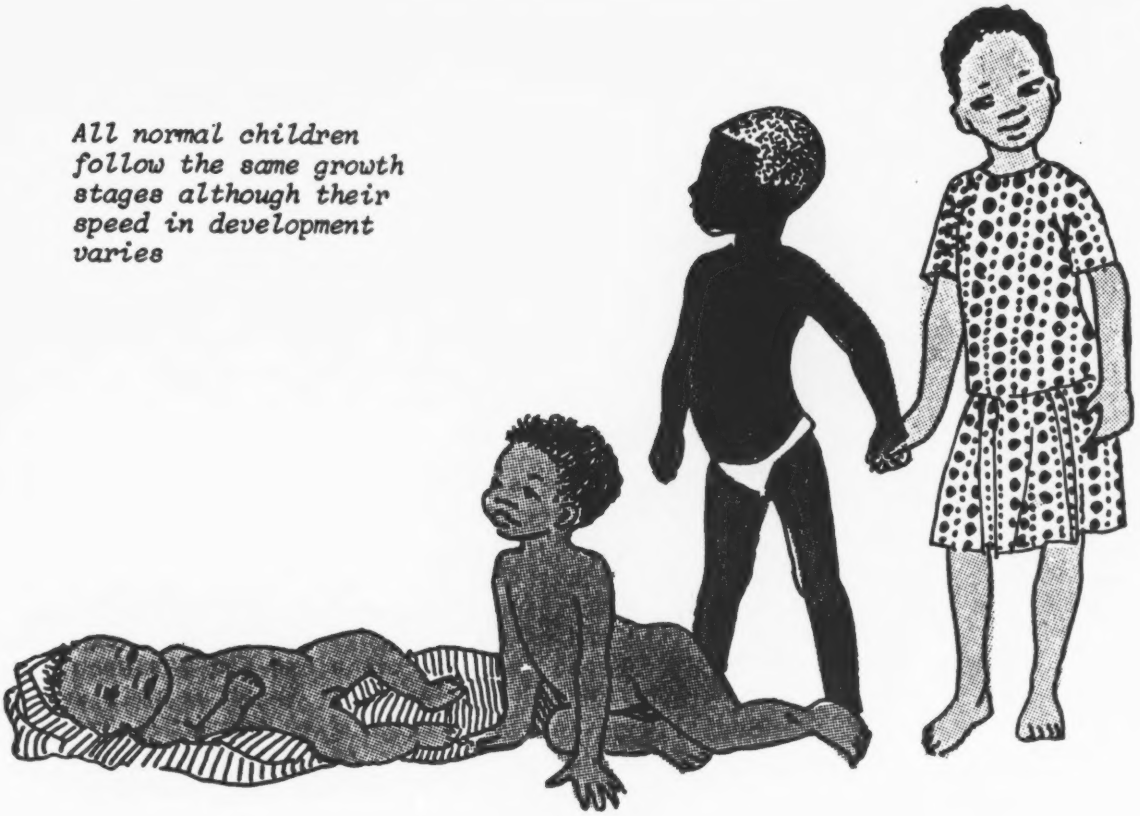
9. What is the treatment for simple swelling of a newborn's scalp?

Assure the mother that the swelling will fade away.

(From: Ross Laboratories.)

STAGES IN CHILD DEVELOPMENT

All normal children follow the same growth stages although their speed in development varies



Infancy: birth to 2 years

The young infant seeks safety and security. As people respond to his needs by feeding him, loving him, making him clean and comfortable, helping him to learn and do things for himself, he develops confidence in his world and in the people around him.

Between birth and 3 months

The infant's muscles grow and strengthen so that he can hold his head up when he is put in a sitting position and can tighten his muscles when picked up. He can hold his eyes in a fixed though vague position and he can hold light objects in his hand but probably does not pick them up. He begins to notice a human face and may begin to smile.

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4-6 months

The infant smiles when he sees a person and likes to have persons pay attention to him and talk to him; he chuckles, coos and laughs and becomes very sociable. By 6 months he is very vocal, using his voice and making meaningless sounds. He recognizes his mother and knows which people are familiar and which are strangers. His body strengthens and he has much more command over it. He is delighted with his ability to move his head, to play with his hands, to put things in his mouth, to roll over and rest on his elbows and even perhaps to sit up for a second or two.

7-9 months

He fingers and manipulates objects and his own hands and wrists, bangs on things, puts them in his mouth. Physically his coordination skills increase and he uses his thumbs with his fingers more easily and uses both hands. Reaching and grasping are now automatic and he may feed himself with a biscuit or piece of bread. He can sit alone and may even crawl or stand. He may begin to get teeth at 6 to 8 months. Socially he learns to respond to more than one person at a time, he likes rhythm and being bounced about but he can become easily over-excited. He enjoys singing to himself, and making other noises with his voice and banging toys together, and he can be self-contained as well as sociable. He begins to respond to his name and to imitate sounds.

10-12 months

By this time the infant can usually roll over and sit up, uses both hands skillfully to feel, pluck, investigate, to put things inside one another; to bang with cup and spoon, to dip into food and to carry things. By the end of the first year he may have six front teeth. He may start to walk or to creep about very actively. He may say the words in his language for mama and dada and perhaps one or two other words.

Socially he is developing. He enjoys peek-a-boo (hiding behind the hands) and patting games with the hands and he is showing interest in his play although he is easily distracted. He may begin to be coy. He notices disapproval or praise in his mother's tone of voice and is socially very cooperative although his behaviour is frequently variable and inconsistent.

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1 year to 18 months

By 1 year an infant's birth weight has usually tripled. He learns to walk. He enjoys pulling, pushing, lifting, pouring, throwing things, playing and splashing in water. He often tries to feed himself and can hold a cup. He may speak a few words correctly. Socially he is full of curiosity and "into everything." He enjoys watching and imitating people, by coughing or sneezing for example. He is more responsive to adults than to other children and is very dependent on his mother. He may show emotions such as affection, anxiety, jealousy, sympathy, shyness with strangers. He begins to show food likes and dislikes.

18 months to 2 years

By about 18-20 months a child is usually constantly on the move, likes to push things, to walk backwards, to chase and hide and be chased; to play with sand or earth and to climb. He begins to speak a few more words. He likes to listen to rhymes, music and to look at picture books. He enjoys an audience and applause and becomes more sensitive to approval and disapproval. He shows some independence and begins to undress himself. He begins to show temper and fear. He gives names to people, things, actions. He may become attached to a particular toy or blanket. At this stage he learns to control his toilet habits.

From 20 to 24 months, he enters into a possessive stage where everything is "mine," and also a negative stage where his reply tends to be "no." He becomes more aware of people and copies household tasks in play. Physically his appetite may decrease, his growth slows down somewhat, and his coordination increases - he can kick a ball and he becomes more skilled with the use of one hand. He becomes more aware of father as well as mother and father often becomes a favorite. He begins to like being with other children.

(From: Ritchie, J., Manual on Child Development Family Life Nutrition. pp. 11-13.)

MAKING GAMES FOR CHILDREN

- for climbers - pieces of wood to nail to the trunk of a tree, and sisal rope to lash them securely
- for obstacles for climbing through - old worn tires can be nailed to a piece of wood side by side to provide a tunnel for children to crawl through; wooden boxes with the top and bottom removed or any other objects which can form a tunnel can be used
- for a see saw - a long plank and a large log
- for a skipping rope - rope made from sisal fibres
- for building blocks - wood cut to careful measurements, or small milk or cigarette cans with sharp edges well hammered and smooth
- for puzzles - old magazine pictures or posters to stick onto thin wood or strong cardboard. These can be cut into small or large pieces according to the ages of the children who will use them
- for pasting collages - seeds, shells, leaves, and other objects to paste onto paper (old newspaper or old mimeograph paper from local offices will do if nothing else is available)
- for making paste - wheat or cassava flour for boiling with water
- for making paints - local roots, leaves, stones (curry, indigo, henna), charcoal, ash and others known locally
- for paint brushes - grass or sticks
- for building cars, aeroplanes, trucks, houses - pieces of sisal stalk, corn and millet straw, pulp of reeds, thorns for fixing pieces together

- for wheels - empty sewing spools (reels) and bottle tops
- for building boats - coconut shells or baobab fruits
- for modeling - clay from the ground or papier maché made from old paper, water and flour paste
- for a sand tray - planks for edges, sand, old tins for carrying water and to use as moulds
- for paper-folding - old paper, to make hats, aeroplanes, windmills, boats
- for weaving - palm leaves
- for sewing - old sacks and raffia (a large needle will be required)
- for making music and rhythm - calabashes, coconut shells, gourds, bamboo sticks and pieces of old metal to make rattles, maracas, flutes, violins, rhythm sticks, triangles and cymbols
- for songs, dances, stories - collect local traditional ones or write new ones
- for dolls and for playing at houses and families, or other imitative play - old pieces of cloth stuffed with rags for heads and hands; corn stalks, banana stalks; scraps of worn-out cloth or waste pieces from the local tailor to make clothes; paint to mark in hair, eyes, etc
- for puppets - papier maché; clothes from scraps of cloth
- for play kitchen and home equipment : plates, pots, cups, spoons - small gourds, coconut shells, calabashes
- for necklaces and bracelets - seeds of all kinds
- for building houses or for storing things - old packing cases, crates or cartons
- for masks - paper bags (sacks)

(From: Ritchie, J., Manual on Child Development Family Life Nutrition. pp. 147-148)

Session 35

HEALTHIER FAMILIES THROUGH CHILD SPACING

TOTAL TIME 4 hours, 25 minutes

OVERVIEW

Child spacing, the number of years between births of children, affects the health of a mother and her children. Evidence from developing countries shows that maternal and child malnutrition and death rates are higher when the births of children in a family are spaced less than two years apart. In this session participants learn about local beliefs, knowledge and practices related to family size, relations between men and women, human reproduction and ways to space births. They discuss national policies related to child spacing, and consider the health and economic benefits of child spacing. They examine specific methods for delaying the birth of the next child. They also practice dealing with rumours about child spacing methods, using family health education.

OBJECTIVES

- To describe local attitudes and practices that affect child spacing.
(Step 1)
- To state national policies dealing with child spacing.
(Step 2)
- To list the health and economic benefits of child spacing.
(Step 3)
- To explain the use, side effects, and effectiveness of at least five methods of contraception.
(Steps 4, 5, 6)
- To practice using health education to counter rumors and misinformation about child spacing.
(Steps 7, 8)

RESOURCES

Concepts and Issues in Family Planning

Community, Culture & Care, pp. 201-206

Handouts:
- 35A National Policies and Programs Related to Child Spacing (to be prepared by the trainer)
- 35B Methods of Contraception

Trainer Attachments:
- 35A Child Spacing for Maternal and Child Health
- 35B A Child Spacing Story
- 35C The Menstrual Cycle
- 35D Dealing With Rumors About Contraception
- 35E The Male Responsibility Program

MATERIALS

Samples of the kinds of contraceptives discussed; visual aids showing human reproduction, contraceptions, benefits of child spacing; films or filmstrips on child spacing.

PROCEDURE

Trainer Note

Please note that the overall goal of this session is to provide future Volunteers with enough information on family planning concepts and issues to be able to:

- address rumors circulating through the community, and
- refer people to available host country services and programs when they request it.

Be sure participants clearly understand, by the end of the session, their role in promoting child-spacing. That role is usually one of passive, not active promotion. Peace Corps in-country staff who are responsible for the technical programming should be able to give you an accurate picture of how the PCV is expected to work in this important area of primary health care.

Continued

Prior to the session find out about national policies and programs related to child spacing. For example:

- Does the government promote child spacing through:
  - media
  - training personnel in service provision
  - free or low cost distribution of contraception?

- Where does counseling on child spacing and distribution of contraceptives fit within the health system?

- Are there restrictions on the distribution of certain kinds of contraceptives?

Prepare a handout summarizing programs or reasons why there are no policies or programs, if that is the case.

Also visit any family planning organizations (such as International Planned Parenthood Federation) borrow visual aids and find out what kinds of activities they are doing at the community level. Ask a participant to arrange a display of the visual aids on child spacing.

If possible invite a local health worker, who has experience in child spacing counseling, to attend the session, to answer questions about local beliefs and practices affecting the acceptability of child spacing. Arrange for an interpreter if necessary and coordinate with language training to make sure that participants have the basic vocabulary needed to discuss these topics.

Coordinate this session with sessions in cross cultural training and personal health related to sexuality.

Step 1
(20 min)

Discussion of Local Beliefs and Practices Affecting Child Spacing

Introduce the session briefly reviewing the objectives and defining "child spacing" in relation to primary health care using Trainer Attachment 35A (Child Spacing for Maternal and Child Health). Point out the display of visual aids on child spacing during your introduction.

Introduce the visiting health worker and ask him or her to describe some of his or her own experiences in counseling for child spacing in the host country. Facilitate discussion of questions such as the following:

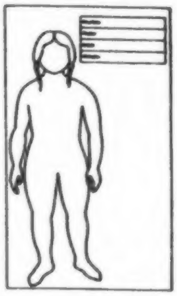
- How many children do most families have? How many do they want?
- Are there any traditional practices for spacing births? Are these used today?
- What do most people think of child spacing?
- What kinds of beliefs and practices affect the acceptability of child spacing?
- Use of particular techniques for child spacing?
- What knowledge do they have of modern child spacing techniques?
- Are there any common rumors about child spacing techniques?

Trainer Note

Community Culture and Care, pages 201-206 provides an excellent list of questions to ask about beliefs and practices related to sexuality, child spacing, and sexual modesty.

Some of the areas of beliefs and practices likely to influence the acceptability and practice of child spacing include: notions about virility, motherhood, body notions (what body parts people will and will not touch, what parts are covered and why), marriage patterns, rules of sexual behavior.

One technique for learning about what people know and feel about reproduction and how the body works in general is to ask them to fill in an outline of the body like the one below. This usually provides a more concrete, less threatening basis for discussing their knowledge and beliefs than simply asking questions.



Emphasize that these are private, sensitive topics; some things that may be discussed in public in one culture are indecent for conversation in another culture. Participants need to have a clear idea of their own beliefs, practices and feelings related to these topics through cross-cultural training. Their own biases or "cultural baggage" they carry to their work site will affect participants' own reactions to the social rules they encounter as well as their ability to work effectively with both men and women in the culture.

Step 2
(20 min)

Discussion of National Policies and Programs Related to Child Spacing

Distribute Handout 35A (National Programs and Policies Related to Child Spacing) and facilitate a discussion that includes the visiting health worker and his or her experience working with this system. Link this discussion back to Session 6 (Health Care Delivery Systems). Some important topics for discussion include:

- How child spacing programs and facilities fit into maternal and child health care services.
- Where and how participants can refer community members who ask them for advice or supplies for spacing children.
- How government programs and policies compare with the local beliefs and practices just discussed.

Trainer Note

If there is a great difference between government expectations regarding child spacing and village realities, have participants discuss how they can deal with this in their work. Also stress the importance of using the terminology that the country uses in its child spacing programs.

If the government does not promote child spacing, discuss the reasons behind this. For example in some areas different ethnic groups are also political groups that do not want to reduce their force in numbers relative to the other groups. Certain religious rules make it difficult for the government to take a position on child spacing in other settings. If this is the case, participants need to discuss how to work in this kind of situation.

If appropriate for the country situation, discuss issues noted in Helping Health Workers Learn, Chapter 23 (The Politics of Family Planning).

Step 3
(30 min)

The Benefits of Child Spacing

Use a picture story such as the example in Trainer Attachment 35B (Child Spacing Picture Story) to start a discussion of the social and health benefits of child spacing. Also discuss when and how this picture story technique can be used in discussing child spacing with people in the community.

Trainer Note

See Concepts and Issues in Family Planning pp.29-43 for a summary of the benefits of family planning.

Step 5
(15 min)

Reviewing Reproduction

Use Trainer Attachment 35 C (The Menstrual Cycle) to present the basic concepts of human reproduction necessary to understand how various methods of contraception prevent pregnancy. Emphasize the ovulation cycle and the times during the month when a woman can get pregnant if she has intercourse.

Step 5
(45 min)

Reviewing the Methods of Spacing Children

Divide into five small groups. Assign each group one contraceptive technique to review and prepare to present to the large group. Distribute Handout 35B (Methods of Contraception). Ask them to include:

- How does the method work in relation to the reproduction cycle.?
- How effective is the method?
- Does the method have side effects?
- How acceptable is the method for the local culture?

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Trainer Note

Select contraceptive techniques that are available in the country and accessible to people in the community. Include mechanical, chemical, behavioral, and systemic methods if possible. Provide samples of the contraceptives, and visual aids to use in their presentations. Make yourself and the visiting health worker available to answer questions.

Step 6
(45 min)

Presentations on Child Spacing Methods

Have each group give their presentation and answer questions. Ask the visiting health worker to help in answering questions.

Also discuss how the presentations could be modified to use in a community and a clinic. Ask the visitor to give her viewpoint as well.

Step 7
(20 min)

Dealing With Rumors About Child Spacing

Begin this activity by asking participants to stand in a circle. Whisper a message into one person's ear and ask them to whisper it to the next person and so on until the message goes all the way around the circle. Ask the last person to repeat the message and discuss how and why it changed going around the circle.

Divide into four teams. Give each team a sheet with a child spacing rumor. Give them 15 minutes to prepare an approach to deal with the rumor in the community applying what they learned in this session. Explain that they will act out their solutions for the rest of the groups. Encourage them to use visual aids from the display in the room, if appropriate.

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Trainer Note

The whispering game should result in a discussion of the way that correct information can become misinformation when it is passed on from person to person. Make sure the message is long enough to assure some distortion of meaning by the time it reaches the last person. Be sure to discuss the importance of continued health education to reduce the circulation of misinformation. Also discuss ways that beliefs and social rules lead people to modify information to fit those familiar notions.

You will find examples of common child spacing rumors in Trainer Attachment 35C (Dealing With Rumors about Child Spacing). If possible ask the health workers to help you select rumors that are common in the local area. Include as one of the rumors the "loss of virility" from child spacing and discuss male responsibility in child spacing using Trainer Attachment 35E (Male Responsibility Program).

Step 8
(60 min)

Presentations and Wrap Up

Have each team present their solution. Ask the rest of the group to act out the part of community members, and bring up additional questions and problems as they think the community would respond. Ask the health worker to participate as well.

After each solution is presented, ask the health worker to briefly discuss how well she thinks the solution would work in the local community.

Wrap up the session with a discussion of the following questions:

- The most difficult thing in this session was...
- The most interesting thing about this session was...

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Table 2.1. Behavioral Methods

Method	How It Works	Contraindications	Advantages	Disadvantages including side effects	Instructions to Care Giver and Client
Natural family planning - Rhythm - Calendar - Basal Body temperature - Mucus	Periodic abstinence. Avoiding sexual intercourse a few days before the time of ovulation and after.	Irregular menstrual periods.	Available. No cost. Safe. Acceptable to religious groups that oppose othe methods.	Requires high motivation, initial and continuing counseling. Restricting. Requires intelligence to understand meaning of BBT, ovulation and tests for mucus. Low use effectiveness. May be difficult to do if menstrual periods are irregular.	Keep careful record of menstrual cycle for several months prior to relying on the calendar method. Learn to distinguish characteristics of mucus and record. Client must learn how to take temperature and to check vaginal mucus. Knowledge that douching, vaginal infection, semen, lubricants, and normal lubrication from sexual arousal can change nature of vaginal mucus.
Withdrawal (coitus interruptus)	Penis is withdrawn from vagina prior to ejaculation. Semen spilled away from vagina.	Lack of control by male.	Available. No cost. No devices. No chemicals Emergency method when others not available. Private. Effective on a mass basis.	High failure rate. Although there are no physical side effects, it can diminish pleasure for both partners. May cause anxiety in female that withdrawal may not be soon enough. May cause anxiety in male that he may not be able to withdraw at the height of his pleasure	Technique usually learned outside of health resources. However, client may need source to answer questions.
				Traditional	
Prolonged lactation.	Tends to suppress ovulation after childbirth for various periods of time.	None	Multiple benefits to mother and child. No cost.	Not completely predictable. Ovulation can recur at any time.	Explain advantages of fully breast-feeding (no supplemental feeding and nursing day and night) to obtain maximum contraceptive effect. When sexual activity is resumed, it is safer to use some other kind of contraceptive after 4-6 weeks post partum, when menstruation resumes, or supplemental feeding is given to baby. Lack of menstruation not a reliable sign of no ovulation.

Table 2.1 Behavioral (continued)

Method	How It Works	Contraindications	Advantages	Disadvantages including side effects	Instructions to Care Giver and Client
Traditional seperation of marital partners after birth of of baby.	Abstinence	None	Multiple benefits to mother and child. Mother can devote more time to new baby and regain strength without fear of another pregnancy. Baby nearly always breast-fed, develops closeness to mother and receives stimulation.	Not conducive to modern patterns of living. Disruption of marital relationship.	Usually criteria for return to husband are set by tradition. Often state of maturity of the child is key.
Polygamy	Provides periods of separation.	Legal restrictions in many countries.	For individual female, may shorten frequency of sexual activity and exposure to pregnancy.	Modern living and shift to urban areas not conducive to multiple households. Increase in legal restrictions. For individual male, may increase total number of children for whom he is responsible.	None
Omens, magic talismans, body movement.	Depends on accompanying behavior.	Local prohibitions.	Use of traditional methods and beliefs.	Very low effectiveness.	None. Instructions usually given by local chiefs, medicine men, traditional birth attendants, or elderly female, family members.
Sex without intercourse.	Expression of caring and fondness of partners without penis-in-vagina intercourse,e.g. touching, petting, hugging, dancing, masturbating (where culturally acceptable)	None.	No possibility of pregnancy. Can be used when there is pain or infection in genital area of either partner or after surgery.	Strong objection on part of one partner.	Discuss advantages provided by this method.

Table 2.2. Mechanical and Chemical

Methods	How it Works	Contraindications	Advantages	Disadvantages and side effects	Instructions to Care Giver or Client
Condoms, also called sheaths. Many trade names and local dialect names. 	A sheath of rubber provides a mechanical barrier to sperm. Fits over erect penis.	Some males cannot retain erection when condom is used.	Not expensive, generally available. No prescription needed. Highly effective when used correctly. Increased effectiveness when used with spermicides. Permits male take responsibility. Effective protection against sexually transmissible disease.	Necessary to interrupt coitus to put it on erect penis. Reduces sensitivity for male. Condoms can break or tear. Some women find it uncomfortable. Rarely produces allergic reaction.	Use condom every time one has coitus. No preliminary contact of penis with vagina before condom is put on. On removal, hold onto condom to avoid spilling any fluid that is inside. Some couples prefer to use foam or spermicides with condom, to aid in lubrication and effectiveness. Store in as cool a place as possible. If condom breaks or tears, woman should insert contraceptive or foam into vagina immediately.
Diaphragm, cervical caps 	Provides mechanical barrier to prevent sperm from entering womb. Inserted into vagina. Sized to cover cervix and fit snugly behind pubic bone. Cervical cap fits over the cervix. Both usually used with contraceptive jelly or cream.	Allergy to rubber. Unsatisfactory fitting. Inability of client to learn insertion technique. Repeated urinary infections. Abnormality such as uterine prolapse, cystocele, rectocele, vaginal fistula, etc.	Negligible health risk. Procedure is simple, once learned. Highly effective when used with spermicide. May protect against sexually transmissible diseases.	Initially must be fitted by a physician or prepared family planning worker. Occasionally cramps, pain and infection may be aggravated by diaphragm use. Usually caused by failure to clean it properly or poor fitting. Some environments not conducive to use–no timing, lack of cleaning facilities, lack of privacy.	Inspect for holes and weakened rim. Timing–diaphragm or cap must be inserted before coitus starts. Thorough instructions about insertion and removal. Do not remove for 6 hours after last coitus. New application of spermicide needed if coitus is repeated. Do not use vaseline as a lubricant as it destroys rubber.
Sponge (new) impregnated with spermicide.	Provides 24-hour protection over cervix by mechanical barrier and spermicide.	Vaginal irritation. Anatomic abnormalities as described above.	Does not need to be fitted. Can be inserted by client. Has strings for aiding removal. Appropriate for times of infrequent intercourse.	Can be used only once. May cause some vaginal irritation.	Instructions about insertion and removal. Do not remove until 6 hours after last coitus.

Table 2.2 Mechanical and Chemical (continued)

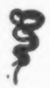
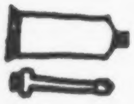
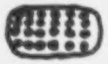
Method	How it Works	Contraindications	Advantages	Disadvantages	Instructions to Care Giver and Client
Intrauterine devices (IUD or IUCD) Many types, eg., Lippes Loop, Saf-T-Coils, Copper-T. 	Immobilizes sperm. Increases mobility of ovum in fallopian tube. Increases production of prostaglandins which inhibit implantation. Prevents fertilized egg from attaching itself to wall of uterus.	History of pelvic infection. Suspected pregnancy. Cervical or uterine malignancy. History of ectopic pregnancy, uterine bleeding. Abnormal uterine shape (fibroids) Cervical stenosis. Uncontrolled anemia. Diabetics more prone to infection. If there are no resources for prompt medical care in case of complications.	High effectiveness. Completely coitus independent. Does not require constant motivation. Device can stay in uterus long periods of time if no untoward symptoms. Attractive option for multiparous women with all the children they want.	Requires skilled and experienced personnel for insertion. Most common complaint is bleeding which needs evaluation if heavy. Cramping and low back pain usually transient. Occasional perforation of uterine wall. Severe pain - rule out ectopic pregnancy. Explusion may not be detected. Lost strings need to be carefully investigated. Occasional fever, chills as a result of pelvic infection.	Describe insertion procedure. Teach how to feel for strings, what to do if they cannot be felt. Explain common side effects. Teach possible meaning of delayed or no period. Provide resource for emergency and follow-up care.
Vaginal spermicides. (suppositories, creams, jellies, foam, tablets). 	2 components: 1. Inert base to hold spermicidal agent in vagina against the cervix. 2. Spermicidal chemical which destroys the sperm.	Allergy. Not sufficient if used alone and risk of pregnancy is critical.	Adds to effectiveness of condoms and diaphragms. Serves as a lubricant. May prevent transmission of some sexually transmissible infections, especially gonorrhea and trichomoniases.	High failure rate when used alone. Must allow time for dissolving after application. Messy, sticky substance unpleasant for some. Difficult to know when foam cans run out. May cause irritation in vagina or of penis.	Describe and demonstrate insertion procedure. Cleansing procedures for equipment. Do not douche until at least 8 hours after last intercourse. Repeat insertion each time intercourse occurs.

Table 2.2 Mechanical and Chemical (continued)

Method	How it Works	Contraindications	Advantages	Disadvantages and side effects	Instructions to Care Giver and Client
Douche	Theoretically, washes semen out of vagina.	Heavy vaginal discharge, pain in pelvic area, infections should be investigated.	Many women like feeling of cleanliness.	Practically no effect as a contraceptive because sperm reach cervix within seconds of ejaculation. May disturb normal condition of vagina. Harmful if strong chemicals are used in douche water.	Client should know that douching is unreliable and why.
Traditional					
Lemon	The half of a lemon, hollowed out forms a dome. Inserted in vagina over cervix. Acts like a diaphragm. Lemon juice is acid and has some spermicidal effect.	Raw, inflamed vagina.	Effectiveness not known, but thought to be quite high if done correctly. Available. Not expensive.	Unknown effectiveness. Detailed preparation.	Client should be told about method and how to do it, if interested.
Cloths, sponges	Substance soaked in vinegar or lemon juice provides a barrier and spermicide, placed in vagina.	Raw, inflamed vagina.	Available.	May introduce unclean substances and cause infection. Unknown effectiveness -- probably low.	Client should know of possibility of infection and probably low effectiveness.
Grasses, leaves, pods, dung, and other semi-solid materials.	Placed in vagina form barrier to semen.	Raw, inflamed vagina.	Available.	Danger of infection, injury, allergic reaction.	Client should know of possibility of infection and probably low effectiveness.

Table 2.3. Systemic

Methods	How it Works	Contraindications	Advantages	Disadvantages and side effects	Instructions to Care Giver or Client
Oral contraceptive, "the pill" Many products, but essentially 2 kinds: 1. combined estrogen and progestin in various dosages 2. Progestin only (mini-pill). 	Suppresses ovulation. Makes cervical mucosa hostile to sperm. Makes uterine lining hostile to implantation.	Absolute Thrombosis. Heart Disease. CVA (Stroke). Cancer of breasts or reproductive organs. Liver disease. Pregnancy. Relative High blood pressure. Migraine headaches. Age (over 40). Smoking. Diabetes. Cervical dysplasia. Gall bladder disease. Sickle cell disease. Undiagnosed abnormal vaginal bleeding. Some medications such as anti-seizure drugs. Caution Depression. Asthma. Epilepsy. Varicose veins. Uterine tumor.	Nearly 100% effectiveness. Independent of sex act. Reversible. May be dispensed by non-professional personnel using checklist of contraindications and side-effects. Benefits: (non-contraceptive) Menstrual cycle Decreases cramps. Shorter periods. Decreased blood loss. Regulates periods. Eliminates mid-cycle pain of ovulation. Treatment of Endometriosis Irregular menses Decreased instances of Ovarian cysts, Rheumatoid arthritis, Fibrocystic breast. Decreased risk of ovarian and endometrial cancer. Decreased risk of pelvic infection and ectopic pregnancy. Safer than pregnancy. Ameliorates anemia.	Requires high degree of constant motivation. Serious complications may cause thromboembolism. Cardiovascular symptoms. Abdominal pains. Chest pain. Leg pain (calf or thigh). Eye problems - blurred vision or loss of vision. Headaches. Gall bladder disease. Side effects are usually minor. Nausea. Fluid retention. Weight gain. Spotting. Cloasma. Breast tenderness. Mild headaches. Urinary infections. Vaginal irritation and discharge. Depression. Change in sexual desire. Combined pills may reduce volume of breast milk in lactating mothers (Progestin does not.)	Discuss dosage, frequency. What to do if pill is omitted. Discuss danger signals. Explain minor side effects. Reassurance. Cancer fears unfounded. No effect on subsequent pregnancy. Need for reporting side effects (follow-up). May only need a change in pill (adjustment of estrogen/progestin).

(From: Concepts and Issues in Family Planning pp. 54-62)

Table 2.3. Systemic

Methods	How it Works	Contraindications	Advantages	Disadvantages and side effects	Instructions to Care Giver or Client
Injection of long-acting progestins. Commonly known as Depo-Provera	Suppresses ovulation. Produces thin lining of endometrium and thick cervical mucus.	Generally contraindications of "pills" (see above) are applied although the basis of this application is questionablesince there is no estrogen.	Well accepted by clients. High effectiveness. Low complications. Given at 3-6 month intervals. Privacy. Does not require constant motivation. Does not suppress lactation. Traditional belief that injections are better than medicine by mouth. Useful for women desiring no more children, who do not want sterilization.	May produce amenorrhea. Delays return of fertility. Possible headaches, bloated abdomen, breakthrough bleeding, or weight gain. Incidence of cancer in laboratory animals is not confirmed in humans.	Explain how method works. Suggest use of another contraceptive for first 2 weeks after shot. Explain possible side effects and what symptoms to report. Discuss possible delay of fertility.
Other Silastic capsules containing progestins.	Inserted under skin. Slow release of progestin.	Same as for "pill" and injections.	Long-term (up to 5-year) effectiveness. Requires no action by client.	Capsule must be removed. Still in trial stages. Same potential side-effects as other systemic methods.	Explain method. Describe possible side effects and what symptoms to report.
Vaginal rings and IUDs impregnated with progestin.	Combines systemic and mechanical action.		STILL IN THE EVALUATION STAGE.	NOT GENERALLY AVAILABLE.	
Drugs, roots, herbs taken by mouth.	Doubtful contraceptive effect. May cause abortion.	Unknown--use should not be encouraged.	Doubtful.	Dangerous. May cause burning of gastro-intestinal tract and other systemic effects. Unknown.	Discussion with client of doubtful contraceptive value and possible dangers.

MOTHERS AND CHILDREN
BULLETIN ON INFANT FEEDING AND MATERNAL NUTRITION

Child Spacing: *for Maternal and Child Health*

by Sandra L. Huffman

PHOTO: UNITED NATIONS

Child spacing, the length of the intervals between births, affects the health of both the mother and her children. Evidence from developing countries illustrates that birth intervals less than one or two years are detrimental to children and the mother in terms of nutritional status and mortality.

Short spacing between births and large family size are often associated with low socioeconomic status, which is also linked to high rates of malnutrition, morbidity and mortality. This makes isolating the factors of nutritional status and mortality more difficult. It is important therefore to control for socioeconomic status when studying the effect of child spacing on health.

Studies in Candalaria, Colombia, have shown that as the number of children in the family increases, the per capita expenditures on food decrease. When families of similar socioeconomic status with 2 adults and 2 children were compared to those families with 4 children, one study found nearly a 500 kcal. difference in food consumption. Where increases in family size are associated with decreases in food expenditures and food consumption, it is evident that increasing spacing between births will ensure more food availability for children.

Aside from influencing general food availability, birthspacing has an impact on breastfeeding duration. A major problem for the older child in a short interval is early weaning. One of the most common reasons for early weaning is a new pregnancy. In a study in Senegal, one-third of all children were weaned because of a new pregnancy. Mortality was much higher among those weaned too early, and the probability of death within one year following weaning increased by 50-150 percent.

Similarly, the nutritional status of the older child is affected by birth spacing. In the Colombia study, the child born before an interval less than 2 years was much more likely to be malnourished than the child who was 2 or more years old before the next sibling was born. A similar finding emerged in Thailand, where the percent of children malnourished was 70 percent for children younger than 2 years when siblings were born, 53 percent for those over two years, and 37 percent if there was no subsequent child born.

Inadequate birth spacing also influences the nutritional status of the child born *after* the interval. In general, birth weight increases with birth order up to the fourth or fifth birth for young mothers age 15-19 years, and mothers age 20-24 years. In contrast, higher order births (more than five) are associated with increases in the proportion of low birth weight infants, presumably because of short spacing. It has been suggested that low birth weight is in part caused by negative effects on the mother, referred to as the "maternal depletion syndrome." This means that inadequate spacing between births does not allow the mother the necessary time to replace resources used during the previous pregnancy. Such results were noted in studies in the United States and India.

A study in the U.S. matched births within 1 year of the previous full-term pregnancy to those that were over 1 year. The variables used were hospital of birth, sex, race, and socioeconomic status. The study found a significantly larger mean birth weight in infants born after longer intervals. In the study, short spacing was a result of biological factors, not socioeconomic differences between the two groups. An interesting finding was that intelligence scores for childen at four years of age were significantly lower in the short birth interval group.

Major increases in mortality have been noted among infants born after short intervals. A recent analysis of the World Fertility Survey in 29 countries found that children born after intervals greater than 4 years had significantly less risk of mortality than those born after intervals of 2 years or less. The study did not control for socioeconomic status, which may in part explain the results. Another study which controlled for maternal education found lower mortality rates for children born after birth intervals of more than 2 years.

Child Spacing

Studies conducted by the World Health Organization have found similar results in India, Turkey, Lebanon, and the Philippines. Mortality was higher among children born after intervals of less than 1 year, and mortality consistently decreased for children born after 3-4 year birth intervals.

In Ecuador research has found that the mortality rates of children born before or after short birth intervals are substantially higher than those born preceding or following longer intervals. When pregnancy occurred within 2 months of a previous surviving birth, infant mortality of the subsequent birth was nearly 3 times as high as for children born when pregnancy occurred 3 to 14 months after a previous birth.

Birth interval has also been shown to affect infant mortality in Malaysia and Bangladesh. In Malaysia, when the birth interval was less than 15 months, the infant mortality was significantly greater than when a longer interval preceded the birth. In Bangladesh, post-neonatal (1-12 months) mortality declined from 42 deaths per 1000 live births for intervals of less than 12 months, to 23 deaths per 1000 live births for intervals of 12-24 months, to 15 deaths per 1000 live births for intervals greater than 24 months.

Recent analyses conducted at Princeton University using data from 25 developing countries illustrates a substantial impact of spacing on child mortality. If all births were spaced at least 2 years apart, infant mortality can be reduced by 10% and child mortality (ages 1-4 years) by 16%.

Increasing spacing between births is an important way to promote the health of young children and mothers, although many of the benefits of birth spacing may be indirect. The mother has more time for each child—to breastfeed, to prepare weaning foods, or to care for a sick child. Her other work responsibilities are less of a physical strain if she has fewer young children to care for. Increased birth spacing may also mean that there is more food available for the family, and illness and disease may be reduced because of less crowding in the home.

For the first child, increasing spacing provides the advantage of longer breastfeeding and maternal attention. For the child born following the interval, increased spacing will mean a greater chance for a higher birth weight. The risk of mortality of both children is reduced when the interval between births can be extended because of the nutritional advantages, increased maternal attention, and possibly lowered rates of infection among children more widely spaced.

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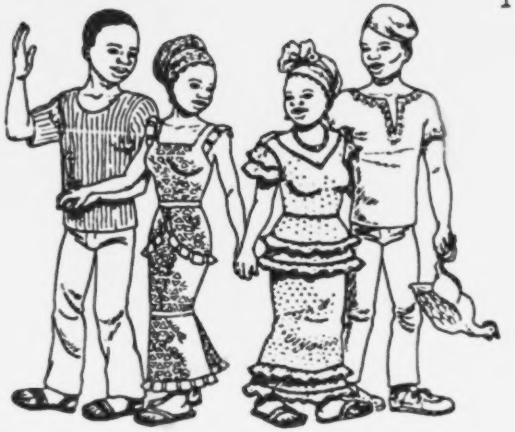
(From: "Mothers and Children: Bulletin on Infant Feeding and Maternal Nutrition". Vol.4, No. 1. pp. 1-2)

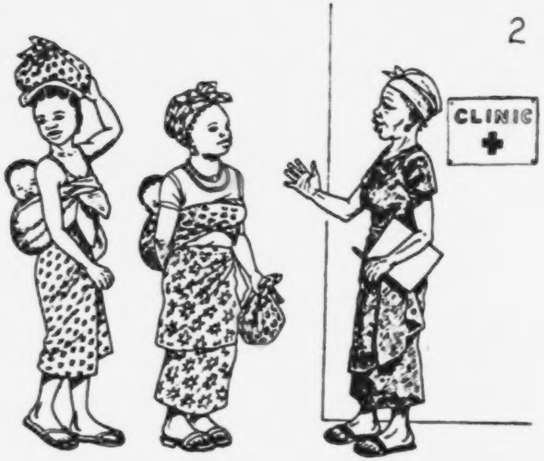
CHILD SPACING STORY

1

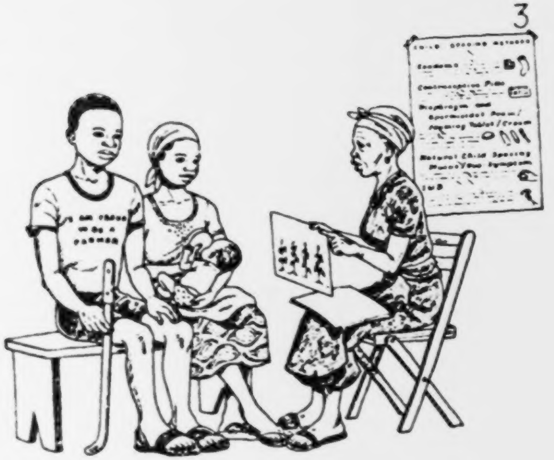


PICTURE #1: Fatu and Musu are good friends. They grew up in the village together. Both of the girls grew up to be fine, fat and healthy. When they became older, they found men who really loved them. When they were both 16, they got married to different men at the same time. Fatu married Flomo, and Musu married Kerkula.

2

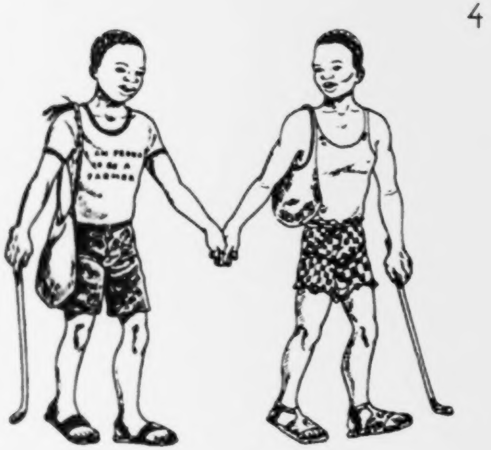


PICTURE #2: Soon both of the women got pregnant. When the time came, both mothers delivered fine sons. After the babies were born, both women carried their sons to the clinic. They learned different things about keeping their babies healthy and about staying strong themselves. One thing they learned about was child spacing. Each woman went home and advised her husband about what she learned.



PICTURE #3: When Fatu went home to Flomo, he found what she had to say interesting. He was convinced that it was good to use child spacing medicine so that his wife could rest before their next baby was born. They went to the clinic and listened to the nurse. She explained that children can not be born to close together, or they will be weak. Just like farmers know corn cannot be planted too close together, or the plants will not grow big. She explained the different child spacing methods, and Fatu and Flomo agreed on a method to use together.

When Musu went home to her husband, Kerkula, she found that the man was against the idea of child spacing. He wanted to have as many children as quickly as possible.

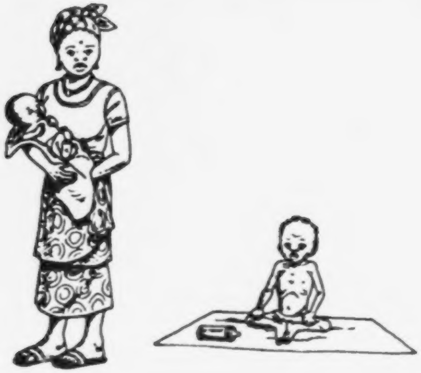


PICTURE #4: One day the two men met out on a farm. Flomo greeted his fried Kerkula and said, "My friend, you are looking happy today! What news?" Kerkula said, "Ah, yes Flomo, today I have good news. Of course you know that two months ago my wife Musu bore me my first son and made me a proud man. Well, I just learned that the woman has belly again! Soon I will have plenty of children to work on my rice farm, and I will be a rich man!"

When Flomo heard this he laughed to himself. He said, "Kerkula, I too want a large family so that I will one day be a rich man myself. But I am a young man now and I will take time with having more children. My own wife, Fatu, bore me a fine boy the same time your child was born. He is strong and healthy. Because we want him to remain healthy, my wife and I are practicing child spacing for two or three years. When that time has passed, we will have another child. I know it is better to wait two or three years between each baby. That way the children and the mother will stay strong. Of course, it will take some time, but one day I will have a family bigger than your own! It is foolish to have children so close together. The children will not be healthy. You will see that my way is best!"

The men parted and went their separate ways. Each thought the other was foolish. Each man thought that his way was the best way to have a large family.

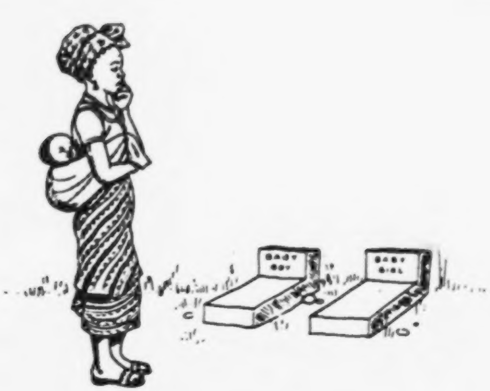
5



PICTURE #5: Before Musu's baby could walk, her second baby was born. Two months after Musu delivered her second baby, her first child became very sick. Since Musu did not have enough milk for two babies, the first baby was taken off the breast. He became very weak and dry. It was not long before the poor, sick child died.

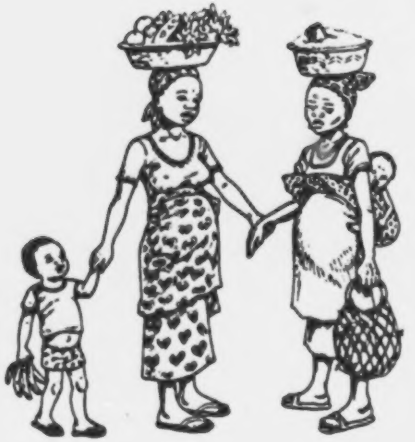
Musu was very sad her first baby died. She also felt afraid that the new baby would go back too. Even the new baby was looking very dry and small. And those were not the only things troubling Musu. She knew that she had belly again, and she was feeling too weak and tired.

6



PICTURE #6: It was not long after Musu's third baby was born that her second child died. Musu was very troubled. She knew that she must do her best to keep her third baby healthy. She was afraid that she might even have belly again, for the fourth time. She herself was no longer fat and fine. She looked very tired and dry.

7



PICTURE #7: One day Musu saw Fatu in the market. Fatu had her fine, fat child on her back. Musu called to her, "Oh, Fatu, my sister, it's me your old friend Musu!"

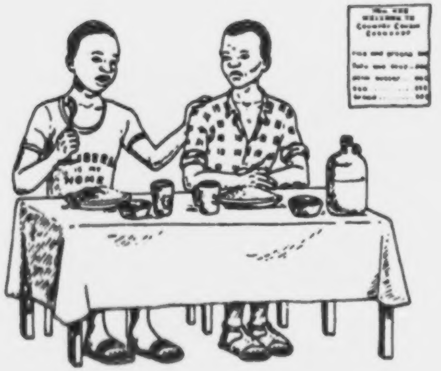
Fatu stopped. She said, "Oh, my sister Musu! I didn't know you. You're looking strange to me . What happened! You haven't been well in body? And, oh, your baby is so small and dry. I'm sorry for you because your first two babies died.

"Yes, Fatu, it's rough this time. My first baby boy and my second baby, a girl, went back. And now even my third baby is not good. I have belly again, and I am too tired this time. But you, my friend, oh you're looking too fine and your baby is fat and beautiful."

Fatu said, "My sister, ever since I bore my boy child, my husband and I have been practicing child spacing. Now that my son is almost three years old, and we are both strong in body, I am pregnant again. We thank God for everything this time!"

Musu listened to Fatu explain about the way she and Flomo practiced child spacing. Because she was very tired and wanted to rest, Musu was very interested. But she knew that her own stubborn husband would never agree to child spacing and she was discouraged.

8



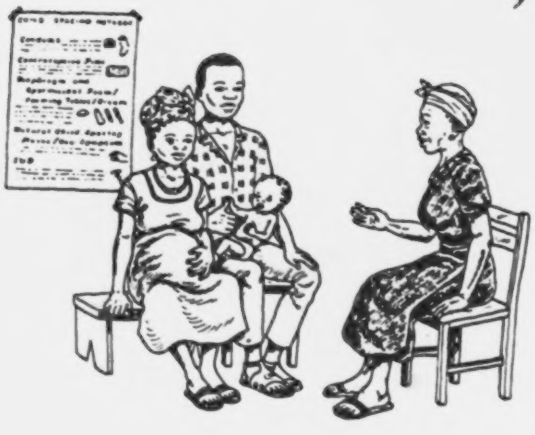
PICTURE #8: One day, a few months after the women met in the market, Kerkula and Flomo met inside a cookshop. When Flomo saw his old friend, he said, "Ah, Kerkula, my man, I haven't seen you for a long time. What news this time?"

"Well, my brother," Kerkula said, "I am sorry to say that things are not good with me. The first two babies my wife bore me have already died, and our third child is very weak and dry. My wife, Musu, is not well in body and is looking dry. I am convinced someone is witching me and my family! That is why all my children die and my wife is weak."

What kind of things are you talking, Kerkula? No one is witching you or your family. You are not practicing child spacing, so your wife will soon be a tired old woman, if you do not let her rest. I thank God, because my wife and I are well in body, and we have a strong boy child and a fine new baby girl. Ain't I told you before that we are serious about child spacing medicine? Fatu will not get belly again until the new baby is big. One day, I know our family will be large past your own, because we are taking time to space our children. But you, Flomo, are suffering! Your children die and your wife is weak because you are a stubborn man! If you would learn about child spacing business, your children would not die. And your wife would have time to get strong again.

When he heard this, Kerkula was shamed. He decided it was time to learn about child spacing methods, so that he would have a healthy wife and family one day.

9



PICTURE #9: So Musu and Kerkula went together to the clinic. The nurse there was kind and patient with the unhappy couple. They listened to the nurse as she told them these important things about child spacing:

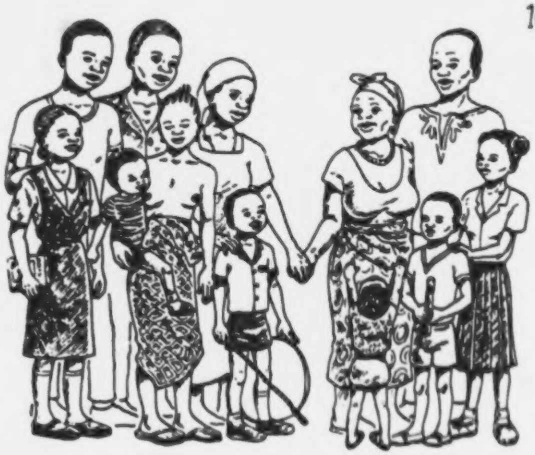
"My people, long ago, life was very hard for mothers and children. Few babies lived long enough to become strong health boys and girls.

Today, people know that their babies can live and grow up strong and healthy if they practice child spacing and other good health habits.

Too many babies too soon means that the children will be sick and the mother will be weak. Child spacing means helping mothers and children to be strong and healthy."

So Musu and Kerkula learned about the different child spacing methods and agreed to use one of the methods together. They also remembered what the nurse told them about caring for their young baby, so it too would not go back.

10



PICTURE #10: After many years went by, both Kerkula and Flomo were rich men with fine families. Flomo and Fatu had five grown children who all worked hard on the farm and made them proud. They were satisfied because they had taken time to space their children, and all had remained healthy and grew to be adults.

Because Kerkula and Musu were late to practice child spacing, they did not have as many living children as Flomo and Fatu. But after they started to practice child spacing, they found that their babies lived to be healthy, grown children. Kerkula was glad to have a healthy wife again, and his three, fine children gave him happiness in his old age.

(From: Teaching and Learning with Visual Aids. pp. 148-167.)

THE MENSTRUAL CYCLE

WHO: 15 nurse aids.

WHAT: the nurse aids will be able to explain the changes in the lining of the uterus and the ovaries that occur during menstrual cycle.

WHERE AND HOW LONG: in a room at the district health center, for 15 minutes.

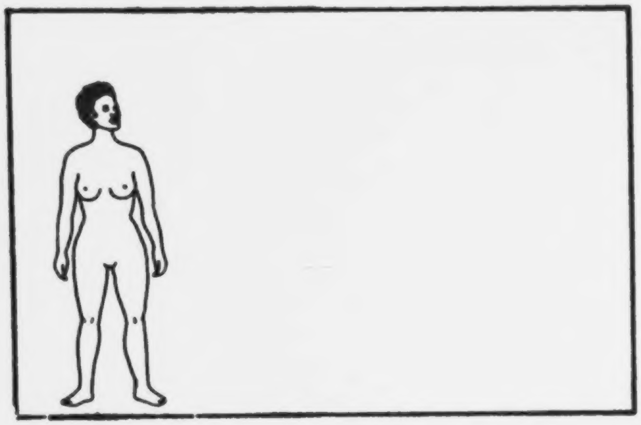
TEACHING METHODS: group discussion and lecture.

VISUAL AIDS: large paper or cloth figures with movable parts, chalkboard.

HOW TO KNOW EFFECTIVENESS: -students will use the visual aids to accurately explain the changes in the ovaries and lining of the uterus during the menstrual cycle.

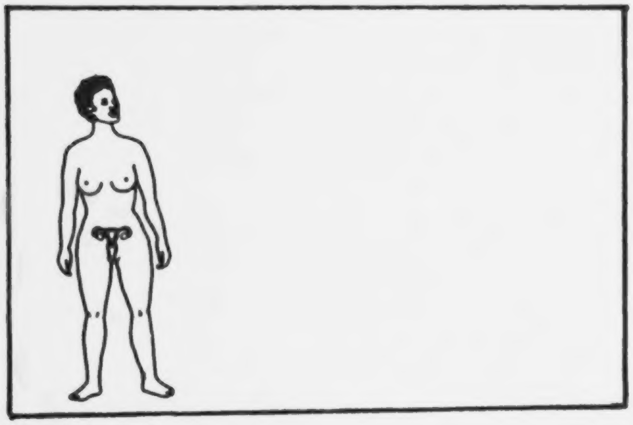
STORY

Menstruation is the regular bleeding in women during the years when they can bear children.



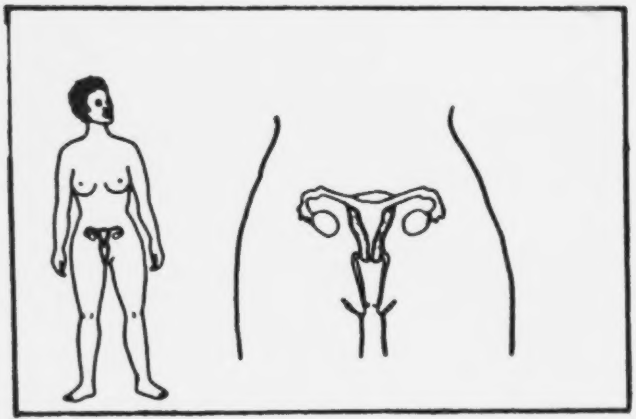
How to use:
Tape a large picture of a woman to the chalkboard.

This bleeding is the shedding of the thick lining of the uterus that takes place each month.

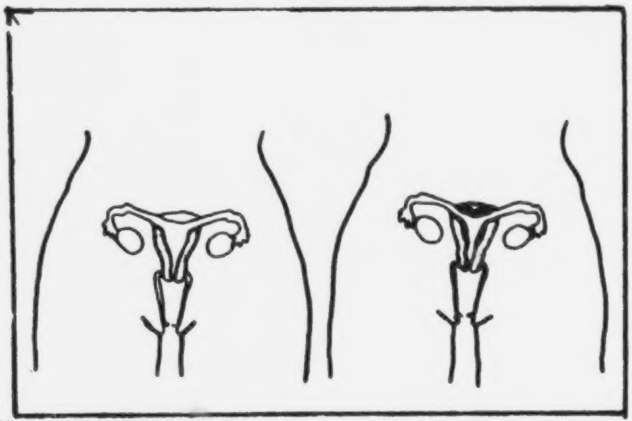


How to use:
Tape or pin a paper or cloth uterus to the picture.

STORY

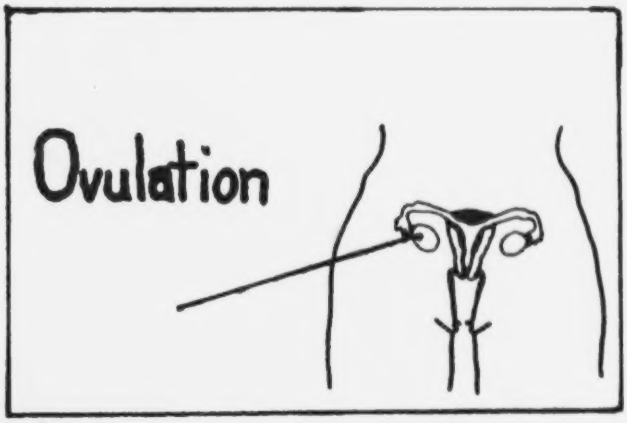


How to use:
Tape a larger picture of the uterus and ovaries beside the picture of the woman.



How to use:
Remove the picture of the woman. Tape a picture of the uterus with a thick lining beside the other picture.

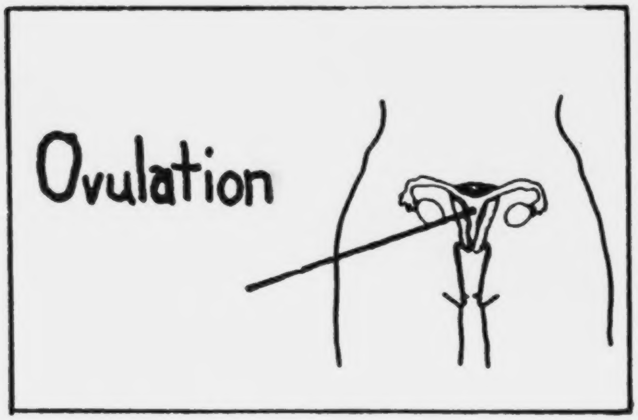
Every month the lining of the uterus thickens, preparing to receive a fertilized egg that could grow into a baby.



How to use:
Remove the picture that shows the thin lining. Write ovulation on the chalkboard Move the egg on the wire from the ovaries through the fallopian tubes.

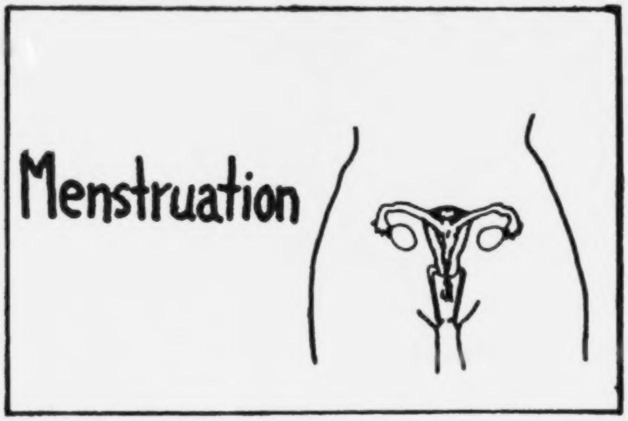
When an egg matures it leaves the ovary. This is called ovulation. Then the egg moves slowly through the fallopian tubes, taking about 6 days to reach the uterus.

STORY



How to use:
Move the egg on the wire through the uterus and outside the body.

If the egg is not fertilized by a male sperm while in the fallopian tubes, it moves through the uterus and outside the body.



How to use:
Erase ovulation. Remove the picture of the thick lining and put up the picture showing menstruation.

About 14 days after ovulation the uterus begins to shed the thick lining. This is called menstruation.

Summarize by repeating the same presentation using the visual aids in the same way. Ask one of the nurse aids to explain menstruation using the visual aids

(From: Teaching and Learning with Visual Aids pp.214-215.)

DEALING WITH RUMORS ABOUT CONTRACEPTION

Rumors about family planning methods flourish around the world. Oral contraceptives (OCs) and intrauterine devices (IUDs) especially are often the subject of exaggerated or wholly fanciful accounts that circulate informally wherever people—particularly women—gather. A common fear, shared by some health workers, is that reversible family planning methods such as OCs and IUDs will make women permanently infertile. Such rumors may discourage couples from using any contraception at all (48, 92, 299, 367, 381).

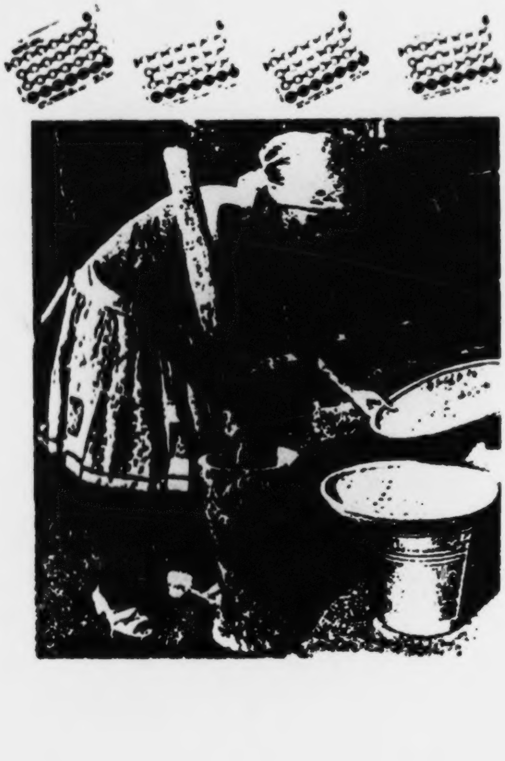
In developed countries, despite recent epidemiologic studies showing that OCs protect against ovarian and endometrial cancers (106, 393), concern that OCs cause cancer is widespread (241, 329, 335). Reports linking contraceptives with cancer and other serious diseases appear regularly in television, newspapers, and magazines. Sometimes these reports are based on a single study, often reported out of context, and sometimes they are purely speculative.

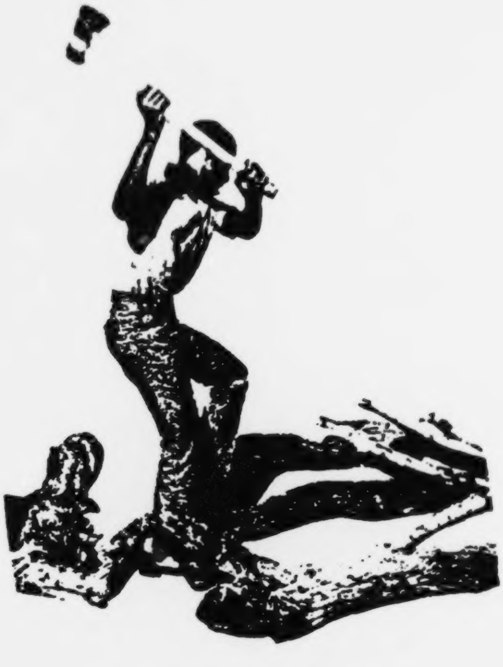
In developing countries a variety of negative rumors about contraception may circulate For example, in Bangladesh some people think that using a condom will make a man's penis fall off (275). In Morocco some women think that OCs cause heart palpitations and can be used safely only by women rich enough to afford a balanced diet (300). A common rumor in Guatemala is that OCs are not absorbed but instead build up in the stomach, forming a large mass (49).

Rumors such as these lead many people to believe that contraceptives are dangerous. For example, in a survey of 567 Guatemalan men and women, 24 percent believed that OCs permanently damage the user's health (51). In Egypt a survey of over 2,000 women found that 60 to 75 percent thought that OCs and IUDs were unsafe, and 22 to 25 percent thought that male and female voluntary sterilizations were unsafe (55). After interviewing women in six developing countries, Perdita Huston noted,

> False rumors about modern contraceptive methods are often responsible for widespread fears about family planning. Everywhere I traveled, family planning workers told me about the impact of rumors in hindering acceptance of contraceptives. The tales that circulate are sometimes extravagant. In Kenya, for example, I was told that there "was a woman who got sick and had to be operated on. They opened her brain and found her IUD." Such rumors were legion in all the countries I visited. I was also to hear that "once you take the pill you will become sterile," and "pills produce deformed children." (199)

Rumors that modern reversible contraceptives cause permanent infertility or birth defects are common. In Botswana and Kenya, for example, some women believe that OCs accumulate in the uterus





"Taking the pill does not interfere with her work, and it does not bother her husband." These pages from a brochure designed by the Family Health Division, Ministry of Health of Botswana and PIACT refute a common rumor that OCs cause weakness in both the woman and her husband. Accurate and convincing communications are needed to dispel fears that may discourage contraceptive use. (Family Health Division, Botswana)

They think that surgery is necessary to remove the pills before a woman can become pregnant (530). In the Philippines some women fear that pills will accumulate in the body and cause deformities in children, even in children conceived after women have stopped taking pills (299, 356). Rumors about permanent infertility after contraception may be most common and most frightening where rates of infertility are high.

Rumors and Fears Discourage Use

In both developed and developing countries rumors and fears about contraceptives discourage the use of family planning. In a US survey of over 1,200 sexually active adolescent women, for example, 27 percent reported that they did not use family planning because they believed contraceptives were dangerous (526). Luella Klein, President of the American College of Obstetricians and Gynecologists (ACOG), estimates that more than three million US women do not use contraception and put themselves at risk of unwanted pregnancy because they fear complications from contraception (241). Undoubtedly, many more continue to use contraceptives but worry needlessly.

Rumors and fears can have similar consequences in developing countries. A survey of 530 girls attending secondary schools in Benin City, Nigeria, found that over 70 percent were opposed to modern contraceptives because they thought that these methods would harm their health and future fertility. Most of the girls were sexually active, and 30 percent had had at least one illegal induced abortion. At the time of the interviews, 44 percent were not using any contraception, 10 percent were using unreliable methods such as coitus interruptus or calendar rhythm, and only 6 percent were using OCs (332). Fear of infertility and other complications from contraceptives exposed these girls to the far greater risks of infertility, serious illness, and death from infected illegal abortions (273).

In Egypt a survey found that women who thought any one contraceptive was dangerous were less likely than other women to use any type of family planning. Among those who felt that OCs could cause disease in a healthy woman, 52 percent were using contraception. Among women who felt that OCs were safe, 62 percent used contraception (55).

Given the alarming nature of many of the rumors about contraceptives, the fact that nonetheless many people do use contraceptives testifies to the strength of their desire to plan their families. After learning through interviews of the rumors and beliefs about contraception circulating in a slum area of Rabat, Morocco, Fatima Mernissi commented,

> . . . women who do disregard the community's catastrophic warnings against the pill and the IUD exhibit real courage and nonconformity, dramatizing the desperation of the young mother's need to space her children. Some—usually the younger mothers under age 25—go so far as to adopt a method they truly believe to be potentially lethal. (300)

Rumors of Infertility Affect Program Policy

Entrenched rumors about infertility have forced some family planning programs to restrict the availability of certain contraceptive methods just to be sure that there can be no basis for rumors. While there is no evidence that injectable contraceptives permanently impair future fertility, family planning programs in Mexico, the Philippines, Sri Lanka, and Thailand have limited the use of DMPA and NET EN to women who have had at least one pregnancy (24, 38, 96, 278). These programs do not want to risk giving injectables to couples who may be infertile for other reasons but who would be likely to blame later reproductive problems on injectables.

Rumors that reversible contraceptives cause permanent infertility or birth defects may have particularly serious consequences for both individuals' decisions and program policy. Scientific research in developed and developing countries, however, provides strong evidence that, with the exception of a few cases with the IUD, such rumors are false: contraceptive methods do not harm women's future fertility or the children they will bear. This research has covered:

- oral contraceptives,
- injectables and implants,
- IUDs,
- barrier methods, including condoms and spermicides, and
- periodic abstinence methods.

DEALING WITH RUMORS

Despite accumulating evidence of the safety of contraceptives, rumors persist, particularly rumors that modern methods can cause permanent infertility or damage to children born later. If many people take these rumors seriously, the rumors can discourage contraceptive use and damage the reputation of a family planning program. How can family planning programs combat these rumors? A number of communication strategies for minimizing the impact of rumors have been recommended. To date, however, there has been no systematic evaluation of programs to deal with false rumors. Thus it is not clear which tech-

A men's community organization in Indonesia discusses the support among their members for family planning. Satisfied users of contraceptives can provide convincing evidence to persuade their neighbors to use contraception. (World Bank/Ray Whitlin)

niques will work best. Nevertheless, actions can be taken to try to minimize problems. Specifically, family planning programs can adopt the following strategies to prevent the spread of adverse rumors:

Improve family planning services:

- help clients choose the most appropriate family planning methods,
- counsel new and continuing users,
- follow up family planning adopters,
- educate men and women about reproduction and the causes of infertility,
- train health workers and pharmacists.

Analyze rumors:

- identify common rumors,
- create a registry for rumors,
- trace rumors to their source.

Develop programs to neutralize rumors:

- use interpersonal communication channels to change attitudes,
- use satisfied clients as communicators,
- involve local opinion leaders,
- develop good working relationships with local media,
- design multimedia campaigns to provide consistent information.

Improving Family Planning Services

One way to minimize rumors is to provide good family planning services (381). Contraceptive failures and certain side effects occur less often with good initial care and follow-up. Also, helping women choose the most appropriate method of family planning may avoid problems later. In particular, IUDs, which increase a woman's risk of developing PID and related fertility problems (see p. J-710), should be discouraged for women at high risk of developing pelvic infection, specifically women with several sexual partners or women who have had pelvic infections in the past. Also, women who want contraceptive protection for only a short period of time—three months or less—should not be given Depo-Provera, which often prevents conception for six to nine months.

Along with contraceptives, family planning programs can provide some other services to prevent infertility and help some men and women who think they may be infertile (see **Population Reports**, *Infertility and Sexually Transmitted Disease: A Public Health Challenge*, L-4, July 1983). Means of preventing infertility that may be feasible in family planning programs include STD screening programs and medication for people with STDs and PID. Couples who are having difficulty conceiving can be taught to recognize when a woman is likely to be fertile, using calendar, basal body temperature, or cervical mucus methods, and instructed to time intercourse to coincide with the fertile period (274). A few procedures for diagnosing some causes of infertility are simple and inexpensive. These include laboratory analysis of a man's semen and monitoring of a woman's basal body temperature and cervical mucus to determine whether ovulation takes place. Drugs are available that induce ovulation, including clomiphene citrate and bromocriptine. These measures, however, can help only some infertile couples. Other major causes of male and female infertility—obstruction in the reproductive tract, varicocele, and primary testicular or ovarian failure—require expensive and complex treatments which may not be successful. Nevertheless, even limited services may reassure clients that family planning programs are concerned with individual needs and not just with limiting the number of births.

Counseling. Accurate and understandable counseling is an essential part of any family planning service. In addition to learning how to use family planning methods, clients should learn about both the advantages and potential disadvantages of the method they choose. This "two-sided" approach may (1) increase continuation rates and (2) reduce the impact of negative rumors (381). Discontinuation for side effects can be reduced substantially if women are counseled as they start a method about what to expect. In early clinical trials of Norplant, for example, the discontinuation rate for menstrual disturbances among a group of users who were not carefully told about side effects was 10.5 per 100 women at one year (362). Among another group, who were reassured that bleeding problems would subside and that the irregular patterns had no harmful effects, the discontinuation rate was 5.2 (432).

Careful counseling also can ease concerns over possible long-term side effects. Women who are told initially that DMPA can delay the return of normal menstrual cycles, for example, may be less likely to worry about rumors that injections cause permanent infertility. Also, they may be less concerned if they do not conceive immediately after stopping DMPA and thus may be less likely to spread rumors themselves. Accurate information from clinic staff also will increase the credibility of the program in the community and may help discourage the spread of rumors. Also, women who have had their questions answered carefully and sympathetically by clinic personnel may be willing to ask clinic personnel about rumors they hear rather than just repeating them.

Follow-up of contraceptors. Follow-up of contraceptive users also may diminish the spread of rumors. Short-term follow-up of new users—within two to three months after they start contraception—reinforces the decision to use contraception. Family planning workers can reassure the woman or man, answer any questions about side effects or proper use of the method, and discuss any rumors she or he has heard. This may lengthen use, increase satisfaction with the method, and ultimately help to prevent and to counter negative rumors (381, 396).

Long-term follow-up may further reassure clients and family planning workers that contraceptives do not prevent the return of fertility. If programs accumulate their own statistics on pregnancies after the use of family planning, these data will reassure health workers and encourage them to give realistic and accurate advice to clients (79).

Educating men and women about reproduction and infertility. Along with information about contraception, family planning programs should provide clear and simple information about human reproduction and the causes of infertility. Rumors tend to circulate and thrive when people lack the basic knowledge underlying any new idea or product (381). Since infertility is both feared and poorly understood, some people may associate the voluntary short-term protection provided by family planning methods with involuntary infertility.

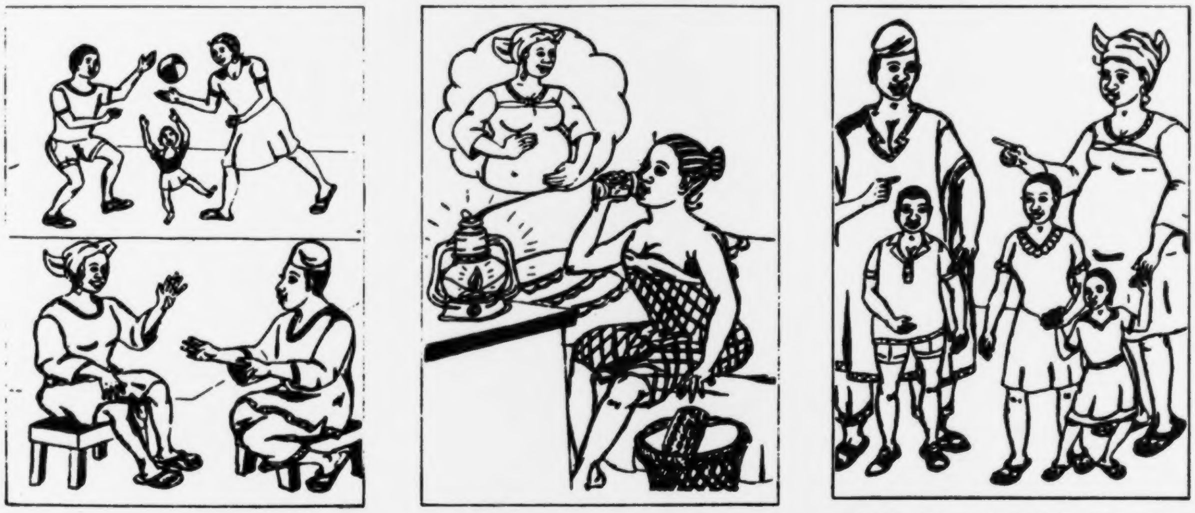
The information people need varies in different areas. For example, in countries where malaria and sickle cell disease are common, women must be told that these diseases can cause spontaneous abortion and thus childlessness even in women who are able to conceive. In areas where the length of breast-feeding is decreasing, the link between early weaning and rapid return of fertility must be explained.

Information about infertility is particularly important where STDs are common and basic health services are limited. Misconceptions about STDs are widespread, and few people know the symptoms of the diseases, how they are spread, and their effects on fertility (21, 77, 251, 317, 358, 475, 512). In addition, by describing the protective effects of OCs, condoms, and other barrier methods against STDs family planning programs can show that these methods, far from harming users, may help to protect future fertility.

Training personnel. Training family planning workers carefully can improve the quality of services and reduce the spread of rumors. Health workers are regarded as experts in family planning, and consequently their comments are accepted and believed (381). Poorly trained workers may unwittingly generate rumors by giving incorrect or incomplete information (102, 381). In the US, for example, even doctors who are candidates for membership in the American Board of Obstetrics and Gynecology often do not know the risk of death from obstetric causes or from OC use (241). Thus they cannot offer the women they serve objective comparisons of the risks of contraception, childbearing, or other activities. Family planning workers should be able to list the different contraceptive methods available, explain how they are used, and accurately describe the potential side effects, disadvantages, and advantages of each.

In addition to technical expertise, family planning workers must have communication skills. A 1983 meeting on the acceptability of family planning, convened by the Economic and Social Commission for Asia and the Pacific (ESCAP), recommended that workers be trained in communication as well as in technical areas. With better communication skills workers can provide technical information in a sympathetic and comprehensible fashion (481). They can also establish an atmosphere that encourages clients to ask questions about rumors they have heard.

Recognizing the key position of family planning workers, family planning programs in a number of countries are including information about rumors in their training programs (16, 150, 356, 381). In Ghana, for example, a training manual about OCs includes an entire chapter on common rumors about the pill and appropriate responses (150) In Botswana the Ministry of Health is preparing a similar booklet for health workers on all contraceptive methods (531). In a 3-week Indonesian training course for family planning field workers, half of one day was spent on rumors—how to identify and rebut them (381).



Tọkotaya l'ero wipe asiko to fun wọn lati bi ọmọ omiran.

Obinrin yi ti pari lilo ogun koro re. o si ti d'awo lilo ogun na duro bayi.

Ebi yi kun fun ayọ pẹlu obinrin ti o tun l'oyun l'ẹhin igbati abigbẹhin wọn ti d'agba daradara. Lilo ogun koro yi ko le ṣe ijamba fun oyun ti o ni nisisiyin.

A booklet prepared for the Planned Parenthood Federation of Nigeria to explain OCs to potential users shows that a woman can become pregnant again when she stops taking the pills. The captions read: The husband and wife feel that they are now ready for their next child (left). The woman finishes her packet of pills and then stops taking the pills (center). The family is happy with the woman pregnant again after her last child is more grown up. Using contraceptive pills will not cause harm to the new baby she is carrying (right). (Courtesy of JHU/PCS) be feasible only in small communities where the person starting rumors can be identified easily and where a convincing rebuttal can be made.

Rumor registry. Investigating rumors of serious side effects may help to allay fears. Roger Rochat recommends that family planning programs set up a registry for rumors of deaths that are reportedly due to contraceptives (380). These deaths should then be investigated. This strategy can correct false rumors or, if deaths have actually occurred, possibly identify flaws in family program services that must be corrected. Reports of infertility attributed to previous contraceptive use might be investigated similarly.

Programs to Neutralize Rumors

Educational programs to combat rumors must use several approaches. According to Donald Bogue and Patrick Coleman, defusing a rumor requires two strategies: (1) correcting mistaken concepts and information and (2) changing negative attitudes or emotions (92). Misconceptions about family planning methods can be fairly easily corrected by providing accurate information through a variety of channels including mass media and interpersonal communication. Changing feelings and attitudes is more difficult since the original rumors and the beliefs they generated were spread by trusted friends and family (92). Interpersonal communication through the same channels is most likely to change these feelings as well as to change family planning practices (381). Combining mass media and interpersonal communication, with one reinforcing the other, is generally more effective than using only one or the other (381, 462, 511).

False Rumors About Family Planning in Botswana

Family planning personnel in Botswana learned that a wide variety of false rumors circulate about family planning. In response, the Botswana Ministry of Health, Family Health Division, is preparing a booklet to address these fears and counter the rumors by giving accurate information (see p. J-719). These rumors may be typical of the types of rumors that circulate in countries around the world:

"Modern contraception causes infertility in men and women, but especially in women with no children."

"Contraceptives cause venereal disease."

"The condom comes off during intercourse and gets stuck inside the woman's body and the woman will have to be hospitalized."

"Frequent use of condoms will weaken a man's strength, which may result in impotence."

"The pills accumulate in the womb or cause sores in the womb."

"Women who become pregnant after having used the pill produce abnormally large babies."

"Pills are illegal and immoral because they kill babies."

"The IUD travels into a woman's body. It may be pushed in during sexual intercourse and will eventually lodge in her throat or brain."

"The IUD penetrates the man's body and travels inside it."

"The IUD grows inside the body and can never be removed."

"A sterilized man cannot perform sexually."

Source: adapted from Larson (254)

Interpersonal communication. Counseling clients and potential users individually or in groups may be the most effective way to combat rumors. Interpersonal communication, also known as 2-way communication, is considered the most effective means of persuading people to change attitudes and behavior (19, 381).

Interpersonal communication is most persuasive when the source of the information is trusted. Generally, people are more likely to accept information from someone like themselves (a homophilous source) than from someone very different (a heterophilous source), as the research of Everett Rogers has shown (381). Thus, sources who share social, economic, and educational backgrounds with the intended audience are most credible and most influential in changing attitudes and behavior (485). Physicians tend to believe what other physicians tell them, whereas village women tend to believe what they hear from other village women. A US study, for example, examined responses of college students to taped interviews about IUDs with different sources—identified as a college student, an older woman, and a physician. Students who heard an interview with a fellow student were significantly more likely to consider using an IUD than students who heard the same interview with the same information given by an older woman or by a physician (83).

When any new or technical information is being conveyed, people tend to trust most someone like themselves in most respects but who also has some relevant expertise or personal experience (83, 381). Thus, effective communicators for dispelling rumors about family planning would include women using contraception, village health workers, and, particularly for rumors about future fertility, women who have discontinued contraception and subsequently given birth (8, 102, 363, 396).

Satisfied contraceptive users can play an important role in educating and motivating potential users (457). Studies of vasectomy acceptors, for example, show that most men decide to undergo voluntary sterilization only after talking with vasectomized men (309). In Guatemala, Thailand, and the Philippines, vasectomy programs have formed "acceptor clubs" for vasectomized men to provide support and information to other men considering the procedure (211, 423, 437). In South Korea "mothers' clubs," groups of village women, were established to spread information about family planning and to distribute OCs (223, 259, 262). The mothers' clubs increase contraceptive adoption, particularly if the club leader herself is using contraceptives (262). Similar clubs have been established in Hong Kong (4).

Involving local opinion leaders. Local opinion leaders, men and women whose views are respected by the entire community, can help establish the credibility of family planning programs. As respected and trusted members of

An urban couple in the Philippines and farmers in Pakistan listen to the radio. In many countries messages about family planning reach the most people on the radio. Such messages should be consistent, easily understood, and relevant to the listeners. (APHA; World Bank)

the community, their endorsement and support are valuable. Their involvement in a family planning program can create an atmosphere in the community that encourages acceptance and continued use of contraceptives (55). Thus an effective program directed at winning the support of opinion leaders will eventually influence the rest of the community as others come to adopt similar attitudes (19, 92, 385).

Identifying and consulting local leaders at the beginning of a program increases the likelihood of their support. Also, as noted, opinion leaders can help identify rumors, find the source of rumors, and participate in preparing and pretesting program messages (481).

Developing good media relations. Family planning programs can use the media to convey information about contraception and to correct mistaken ideas about the risks of various methods. Different media can be used—radio, television, posters, brochures, leaflets, comic books, newspapers, and folk art. The most effective medium or media will vary depending on the communication resources of each area, the level of literacy, the size and diversity of the population, and the access that people have to the various media (511).

Since news reports in the mass media are sometimes the source of false or misleading rumors about family planning, writers, editors, and broadcasters need to learn about family planning. These journalists need simple, basic information, which family planning programs might provide in seminars planned especially for media personnel, through press releases, or through informal contacts between media personnel and family planning leaders. Family planning leaders can volunteer to appear in interviews or to provide scripts, articles, or background information. Above all, a relationship between the media and the family planning program needs to be established that encourages reporters to turn to family planning program personnel for accurate, authoritative information and statements before they print rumors and other possible misinformation about family planning.

Multimedia messages. Experience in family planning campaigns suggests that more people are reached and information spreads more rapidly when several media are used rather than any one alone (381). Also, transmitting messages in more than one medium and repeating the message help people remember the information (28, 441, 485). If only one medium is available, varying the style of the message is better than repeating exactly the same message continuously, even though all messages make the same basic points (485).

In developing countries radio usually reaches the most people (458). A study of over 2,600 women of reproductive age in Pakistan, for example, found that about 95 percent listened to the radio and over half had heard about family planning from radio messages. In contrast, about 25 percent of the women had access to television, about 10 percent to printed materials, and about 15 percent to films. Fewer than 10 percent had heard about family planning through these media (459). Surveys in Bangladesh and Guatemala have reported that about two-thirds of respondents owned radios, whereas very few had access to television, movies, or newspapers (51, 90).

In Bangladesh a campaign to counter the belief that modern contraceptives are unsafe involves 20 radio messages and five films shown on television, in movie theaters, and by mobile projection units in rural areas. Each radio message or film features a dialogue between two men—one providing information about family planning, the other being persuaded to use family planning. While the dialogues differ, in each one the nonuser protests that contraception is not safe, and the other man replies, "These are ignorant tales spread by ignorant people." The messages also urge people to listen to weekly radio programs that discuss contraception at length and answer questions from listeners (275).

Some media campaigns use local folk heroes or entertainers to convey information. These celebrities appeal to the audience and draw attention to the message (28). Testimonials from famous people may convince others to adopt family planning or to change other health-related behavior (485) and may be credible sources of factual information to counter rumors. The Family Planning Association of Hong Kong started a campaign in May 1983, using the character of Huang Fei-hung, a master of martial arts in Chinese folklore, to promote male responsibility for family planning and to disseminate information about vasectomy services. The campaign is credited with increasing attendance at the men's family planning clinic by 36 percent in one year. The number of vasectomies performed increased by 19 percent. Over 40 percent of vasectomy acceptors said that the campaign encouraged them to be voluntarily sterilized (127).

Another possible medium for combatting rumors about contraceptives is folk and traditional performing arts such as puppetry, mime, story-telling, and song (374, 524). Folk arts have been used to communicate family planning information in countries such as Haiti, Thailand, Indonesia, Pakistan, and the Philippines (6, 63, 75, 131, 341). Traditional arts are particularly appropriate for teaching about family planning in rural or highly traditional settings. In addition, folk performers, if well-known and respected, add prestige and persuasive power to the message and increase the likelihood of its acceptance (374). Folk performers, too, might have the credibility to counter rumors effectively.

Media messages must be carefully prepared to be effective. The first step is determining the intended audience. For example, in Bangladesh a mass media campaign stressing the safety of condoms and OCs was addressed to men after research disclosed that men make the decisions about contraceptives and also buy the supplies, including OCs (275). The most effective messages are carefully tailored, using language, symbols, and ideas that are meaningful to the audience. Messages that are relevant to the audience's own lives are most likely to be understood. For example, to counteract the rumor that oral contraceptives weaken the user's husband, a brochure designed by the Botswana Ministry of Health and the Program for the Introduction and Adaptation of Contraceptive Technology (PIACT) shows a man vigorously chopping wood, an important chore in rural areas To prove that OCs do not cause permanent infertility, the final illustration in the brochure shows the woman stopping use of the pill and eventually becoming pregnant (530).

Consulting with members of the intended audience aids the development of comprehensible and acceptable materials. In designing printed materials for nonliterate people, PIACT has relied on focus-group sessions with 6 to 12 individuals. These discussions reveal people's feelings about contraceptives, common experiences and side effects with a particular method, as well as rumors and misconceptions. Focus-group discussions suggest topics that should be covered in printed materials and help to ensure that symbols and messages are meaningful to the audience (531). These techniques are being used in Mexico, Nepal, Nigeria, Zimbabwe, and elsewhere by the Population Communication Services (PCS) project of the Johns Hopkins University, working with PIACT (540).

Family planning programs may need to develop a variety of messages in areas with several ethnic and cultural groups with varying attitudes toward family planning. One message may not be appropriate for all. Surveys in Guatemala in 1978, for example, found that over 90 percent of the "ladino" population knew about family planning and 69 percent approved of using contraception. In contrast, among the indigenous Indian populations only about one-third knew about family planning and fewer approved of the idea. A message appropriate to the "ladino" population—for example, telling where to find family planning services—would have little impact on attitudes toward family planning among the indigenous groups (51).

Effective communication at all levels is essential, both to prevent false adverse rumors from arising and to respond to them if they do arise. Effective communication in family planning requires both accurate knowledge and a well-planned communication effort to present that knowledge in a way that is understood, accepted, and remembered. Family planning communication activities should be as carefully planned and implemented as the other technical components of a family planning program, such as setting up delivery systems, organizing training programs, and conducting surveys. They should be built into any program from the start. To avoid rumors or minimize their impact, family planning communication activities should make full use of the professional expertise that has developed through decades of communication experience in other areas. Paying close attention to the audience and assuring continuity and consistency in the message are the most important principles. In the long run, following the basic principles of good communication is as important in avoiding adverse rumors as is the provision of high-quality services and supplies.

(From: Population Reports J 699. PP.700, 717-724.)

PROJECT DESCRIPTION

THE MALE RESPONSIBILITY PROGRAMME

Jamaica

TARGET AUDIENCE: Jamaican men and, secondarily, Jamaican women.

OBJECTIVES:

- To help Jamaican men develop self-understanding and improve their relationships with others, especially their female partners and children.
- To motivate men to take childbearing and fatherhood responsibilities seriously.
- To encourage men to practice family planning, or at least cooperate with their partner's decision to contracept.
- To educate men about human sexuality, reproduction and population issues.

MEDIA: Posters, newspaper ads, radio spots, seminars, lectures, discussion groups, workshops and print materials such as pamphlets and a comic book.

DONOR/SPONSOR: USAID; the Jamaican government.

DURATION: Advertising campaign--six months; other activities--ongoing.

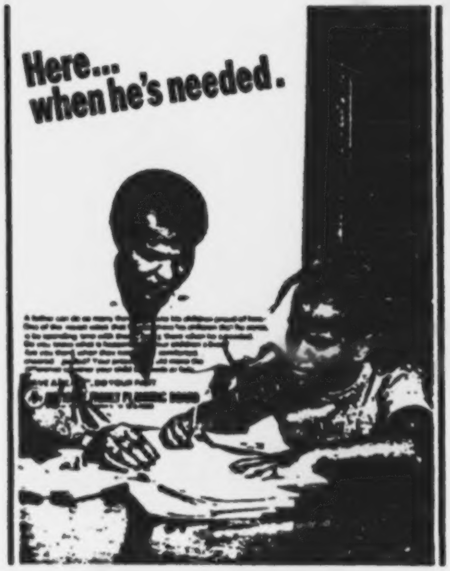
CONTACT:

Mr. Christopher Plummer
Male Responsibility Programme
National Family Planning Board
5 Sylvan Avenue
Kingston 5, JAMAICA

DESCRIPTION:

Until quite recently, Jamaican culture has ignored the role that men could play in taking responsibility for family life, including family planning. In 1983, The Male Responsibility Programme of the National Family Planning Board (NFPB) launched an aggressive series of activities to encourage active male participation in family planning decisions and to promote a more positive image for "male" methods--vasectomy and condoms.

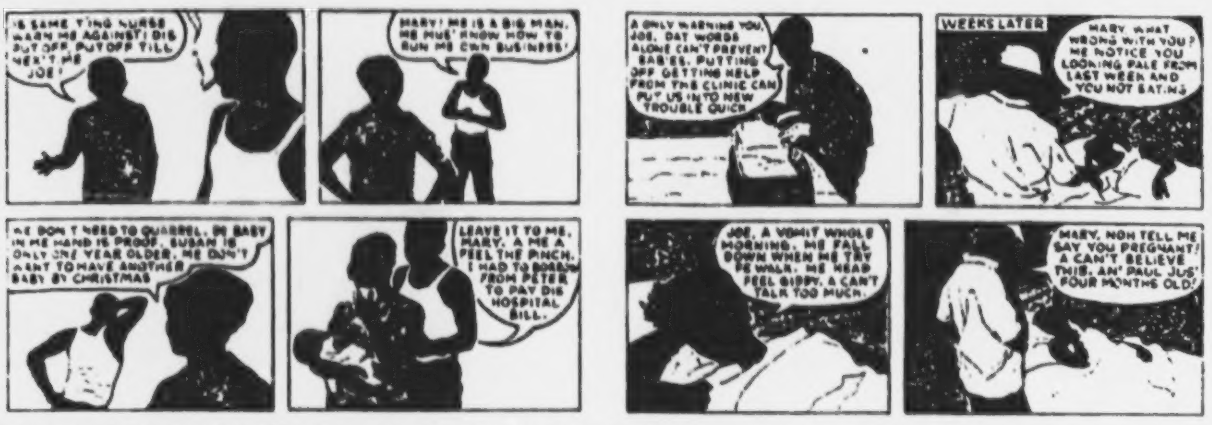
The men's program has only two full-time staff members, but through the use of voluntary collaboration with outside agencies and a "multiplier" effect, the program undertakes a wide range of activities.


Here...
when he's needed.

"Here...when he's needed." Jamaican men are portrayed spending time with their children. (Black and white poster, 12 x 15 inches - 30 x 39 cm.)

Educational Materials

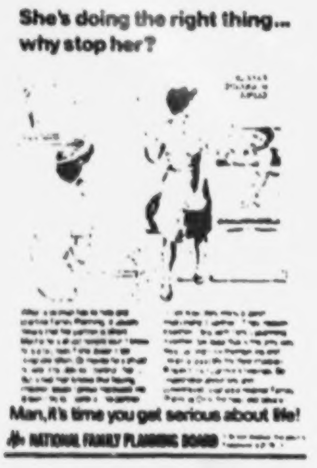
Many of the NFPB's early pamphlets carry the male responsibility message. An attractive, full-color comic book portrays a man who puts off visiting the family planning clinic until it is too late. "Put-off Joe" and his wife must face the unwanted pregnancy that follows. The comic book is distributed to men who attend motivational seminars sponsored by the NFPB. In one six-month period, 2,000 copies were given out.


IS SAME T'ING NURSE WARN ME AGAINST! DIS PUT OFF, PUTOFF TILL NEX'T ME JOE!
MARY! ME IS A BIG MAN. ME MUS' KNOW HOW TO RUN ME OWN BUSINESS!
A ONLY WARNING YOU, JOE. DAT WORDS ALONE CAN'T PREVENT BABIES. PUTTING OFF GETTING HELP FROM THE CLINIC CAN PUT US INTO NEW TROUBLE QUICK
WEEKS LATER
MARY, WHAT WRONG WITH YOU? ME NOTICE YOU LOOKING PALE FROM LAST WEEK AND YOU NOT EATING
WE DON'T NEED TO QUARREL. DE BABY IN ME HAND IS PROOF. SUSAN IS ONLY ONE YEAR OLDER. ME DON'T WANT TO HAVE ANOTHER BABY BY CHRISTMAS
LEAVE IT TO ME, MARY. A ME A FEEL THE PINCH. I HAD TO BORROW FROM PETER TO PAY DIS HOSPITAL BILL.
JOE, A VOMIT WHOLE MORNING. ME FALL DOWN WHEN ME TRY FE WALK. ME HEAD FEEL GIDDY. A CAN'T TALK TOO MUCH.
MARY, NOH TELL ME SAY YOU PREGNANT! A CAN'T BELIEVE THIS. AN' PAUL JUS' FOUR MONTHS OLD!

In the comic book "Put-Off Joe," Mary pleads with her husband to visit the family planning clinic in order to space their children. "Words alone can't prevent babies," she says. The six-page comic book is written in Jamaican dialect. (Full-color, 8" x 6½" - 20 x 17 cm.)

Male Responsibility Advertising Campaign

The National Family Planning Board hired a private advertising firm to design and implement a mass media campaign. Posters, newspaper ads and radio spots portrayed men who had shrugged off their parental responsibility. Dramatic photos carried texts urging men to think before making babies: "Man, it's time you get serious about life!" The posters are distributed at each seminar and workshop sponsored by the NFPB and are displayed at schools, workplaces and male-dominated institutions. Additionally, many groups visit the NFPB to request the posters.


She's doing the right thing...
why stop her?
Man, it's time you get serious about life!
NATIONAL FAMILY PLANNING BOARD

"She's doing the right thing... Why stop her?" Men are encouraged to support their partners if they choose family planning. (Black and white poster, 11 x 16 inches - 28 x 40 cm.)

One-day Motivational Seminars

The NFPB coordinates with factories and other workplaces to sponsor seminars for men. Workers receive full pay while participating in the one-day seminars. Local keynote speakers, role play exercises, and films are used to stimulate small-group discussion on:

1) What it means to be a man
2) Fatherhood
3) Methods of family planning
4) Myths about sex and relationships
5) Responsibility.

COMMON CHILDHOOD DISEASES

DIPTHERIA

AGE AT ONSET	Unimmunized children under 15 years of age.
INFECTIOUS AGENT	Bacteria
MODE OF TRANSMISSION	Contact with patient or carrier. Raw milk has served as a vehicle.
MAJOR SIGNS SYMPTOMS & COMPLICATIONS	Cold with fever, headache and sore throat. Bad breath. White or grayish membrane on one or both tonsils spreading to back of throat. Possible swollen neck.
TREATMENT	Seek medical help.
METHOD OF PREVENTION AND CONTRAINDICATION	DTP immunizations. Same series as for Pertusis.

To date the NFPB has motivated over 400 men in six parishes through this series of one-day seminars. As a spinoff, many groups have requested lectures and panel discussions in their communities. Posters are distributed in each parish after the seminars and stay behind as reminders of the topic.

Five-day Educators' Workshops

Educators from different male-dominated agencies, such as sugar factories and the police department, are brought together to study reproductive health and family planning. They learn to plan and lead seminars, and they conduct a mock seminar during the workshop. The workshop participants then organize one-day seminars for small groups of men from their own communities and workplaces. The participants report back to the NFPB on the seminars and informal sessions they have led.

The NFPB has sponsored one five-day workshop with one female and 20 male participants. All of the participants have led workshops or informal discussions in their communities. Two of these participants have gone on to organize similar week-long workshops in their communities. Others have acted as resource people on sexuality education. A follow-up workshop was held to allow the original participants to discuss problems and successes.

Male Responsibility Program in Schools

The outreach to schools involves:

- In-school sessions to reach boys who will be graduating from fifth form (ages 16-17) and sixth form (age 18). The NFPB would like to develop a packet especially for male students which guidance counselors and teachers could use to lead their own educational programs on reproduction, contraception and sexuality.

- Visits from representatives of the NFPB Male Responsibility Program to parish schools in order to to discuss the topic. This proposal was received from the school principals of the parish after they attended a one-day seminar.

- An essay and poster competition in the schools that involved at least 100 young people from 11 to 25 years of age. "The role of the father in family life" was the theme of the contest, sponsored by the Inter-American Year of the Family Committee. Winning entries were to be honored at an exposition.

RESULTS:

Evaluation data on the Male Responsibility Programme are not yet available.

The program director noted that at one recent seminar led by a doctor, a surprisingly large number of men asked questions about vasectomy. This increased interest marks a significant change in a country where vasectomy has received little attention.

A local newspaper columnist criticized the advertising campaign for its negative approach. She suggested that a more sensitive handling of the subject, such as was displayed in an earlier NFPB-sponsored advertising campaign, is more appropriate. Men who are treated as responsible adults can be expected to act with responsibility, she concluded.

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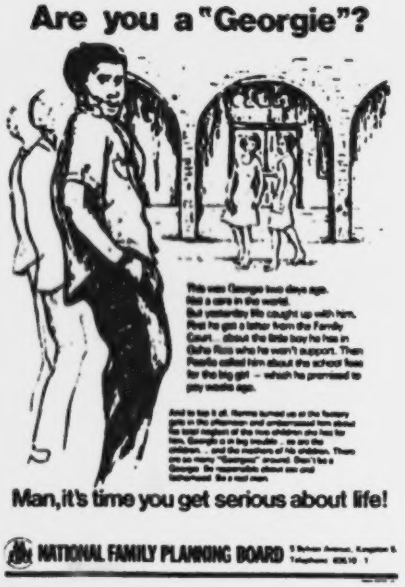
Although some aspects of the campaign have taken a negative tone, the local press has also picked up on its positive messages. A recent newspaper article, written about one of the program's keynote addresses, carried the headline "The Jamaican Male Can Be Good Fathers, Husbands." The posters reproduced in this description demonstrate both positive and negative approaches. Pretesting of both types of message will often indicate that one tone is more effective than the other for a particular audience and topic.


Are you a "Georgie"?
Man, it's time you get serious about life!
NATIONAL FAMILY PLANNING BOARD

Carefree Georgie is in big trouble. He has many children that he has neglected to support. This poster urges, "Be responsible about sex and fatherhood. Be a real man." (Black and white poster, 11 x 16 inches - 28 x 40 cm.)

OF NOTE:

- How effective are the posters from the advertising campaign? The dramatic photographs and drawings probably convey the message themselves, without the need for the large amount of text. An effective poster has an immediate impact and carries its message with as few words as possible.
- The Male Responsibility Programme is finding outlet in cultural expression. The second year class of the Jamaican School of Drama has accepted a challenge from the NFPB to create dramatic interpretations focusing on male responsibility and men in family life.
- Not every family planning association can afford to hire a professional advertising firm to design posters and radio messages. But the Jamaican project has shown that low-cost workshops and seminars have a wide reach. Four hundred men attended the initial motivational seminars, which generated additional lectures and panel discussions attended by more than 3,000 men and women.

(From: Population Communication Services "Male Responsibility in Family Planning".)

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Module 7

Diseases In The Developing World

Behavioral Objectives

By the end of this module the participants will be able to:

1. Describe the causes and clinical symptoms of all diseases discussed in this module, as stated by guest lecturers or described during their sessions.

2. List the vaccines, age when given, and sequencing of shots, that comprise the immunization schedule followed by the host country.

3. Assess the three stages of dehydration using the WHO Diarrhea Treatment chart and determine the appropriate treatment for each stage, according to the WHO Criteria stated in The WHO Module, Treatment of Diarrhea.

4. Prepare Sugar-Salt Solution and ORS solution according to the formulas given in Session 40.

5. Name three water-borne diseases that are endemic to the host country and describe the measures for controlling these diseases as stated in Session 41.

6. Explain how sanitation and good hygiene prevent the spread of disease, as described in Session 42.

Session 36

RECOGNITION OF IMMUNIZABLE DISEASES

TOTAL TIME 3 hours

OVERVIEW

An understanding of the epidemiology of a disease, that is, the patterns of disease occurrence in a given population and the factors that influence those patterns, is essential for designing appropriate and effective interventions and health education programs. Sessions 36, 37 and 38 form an interrelated series of activities designed to provide participants with this necessary understanding. Session 36 treats the recognition of clinical aspects of seven vaccine-preventable diseases (measles, polio, diptheria, pertussis, tetanus, tuberculosis and yellow fever). Session 37 deals with how these diseases are spread and how they are perceived and dealt with in the local cultures. Session 38 examines the prevention and control of the spread of these diseases. These three sessions are considered essential and should be treated as a unit.

During Session 36 participants learn to identify the signs and symptoms of the seven diseases. They also practice making visual aids and formulating health talks about those diseases in their communities.

OBJECTIVES

- To describe and recognize the clinical signs and symptoms of measles, neonatal tetanus, diptheria, pertussis (whooping cough), poliomyelitis (polio) tuberculosis and yellow fever.
(Steps 1, 2)
- To make a village level visual aid and develop a health talk about the signs and symptoms of some of these target diseases.
(Steps 3, 4)

RESOURCES

Control of Communicable Diseases in Man

Handouts:
- 36A Common Childhood Diseases
- 36B Answers to Childhood Diseases Chart
- 36C Case Studies

Trainer Attachments:
- 36A Trainers Glossary
- 36B Case Studies Answer Sheet

MATERIALS Pens, newsprint, markers, WHO slides, and slide equipment.

PROCEDURE

Trainer Note

Prior to delivering these next three sessions you should obtain as much host country specific information regarding the epidemiology of the diseases listed in Handout 36B (Answers To Childhood Diseases Chart) and the Host Country National plan and schedule for the immunization of children against these diseases.

The information presented under Method of Prevention and Contra-indications in this handout is based on the most current recommendations made by the World Health Organization and are the basic guidelines that most countries follow in developing their immunization schedules.

Step 1
(20 min)

Identifying Common Childhood Communicable Diseases

Distribute Handout 36A (Common Childhood Diseases). Ask the participants to try to recollect the illnesses that they had as a child and to list these illnesses, and for each one identify as much of the clinical picture as possible.

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Trainer Note

This first step is an informal pre-test designed to help you and the Trainees assess what they know about the six childhood immunizable diseases included in countries that have an Expanded Program of Immunization (EPI) policy. These diseases are:

- measles
- poliomyelitis
- diptheria
- pertussis
- tetanus
- tuberculosis

Yellow Fever has been included in this session as it is a disease that some countries may have chosen to incorporate in their EPI plans. If Yellow Fever is endemic in the country where you are training, ask the participants to list any information they may have on the clinical aspects of the disease.

Handout 36B (Answers to Childhood Diseases Chart) provides you with information on these diseases.

Trainees should view this step as a form of self-assessment and be informed that you do not expect them to be able to fill in all of the columns for all of the illnesses that they list. However, you should expect that they would be able to identify age at onset, signs and symptoms, method of treatment and prevention for some of the more common diseases. Tell them that the information that they are unable to provide now will be learned by the completion of this unit.

Collect these sheets at the end of Step 1 and tell them that you will be using this information to assess what areas and diseases will be most important to emphasize in this unit.

See Trainer Attachment 36A (Trainers Glossary) for definitions of terms that may be unfamiliar to the Volunteers.

Step 2
(45 min)

Information Pooling

Distribute Handout 36B (Answers to Childhood Disease Chart) and use as a discussion guide.

Show slides and pictures of the diseases you discuss and explain the signs and symptoms of each one. Mention the host country incidence and/or prevalence rates for each disease as well as the case fatality rates. Use the local names of these diseases, if known, whenever possible.

Trainer Note

Allow the participants 15 minutes to review the answer sheet and Trainer Attachment 36A (Trainers Glossary). This handout contains the definition of some terms that you may choose to define. Explain that the pictures and slides they are viewing should answer or clarify some of their questions or understanding about the clinical signs and symptoms of the childhood diseases covered in Handout 36B (Common Childhood Diseases) and information on disease specific rates. Tell them that the illnesses listed in this handout are diseases that are preventable through immunizations and are considered to be some of the major killers of children under the age of five.

Step 3
(60 min)

Developing Visual Aids and Health Talk

Have the group break into 3-4 small groups (no more than five per group). Based on the techniques, information and knowledge that they acquired in studying the community (Sessions 10-14), Session 22 (Selecting and Using Nonformal Education Techniques), Session 23 (Selecting and Using Visual Aids), and in this session, ask them to develop or adapt pictures and dialogues illustrating the signs and symptoms of one or two diseases. Tell them these pictures and accompanying talks should be designed for use in teaching mothers or school children how to recognize these diseases. Explain that they will have about 5 minutes each to present these visual aids to their peers.

Trainer Note

You should obtain some visual aids that are used or displayed in the health clinics and ask the participants to adapt these pictures, charts, etc. using the techniques and information from sessions on health education, in particular Session 23 (Selecting and Using Visual Aids).

15 Minute Break

Step 4
(40 min)

Presentation of Visual Aids

Ask each group to give a 5 minute health presentation using the visual aids. After each presentation, have the participants critique the visual aid and health talk using the criteria and knowledge acquired in the sessions on Health Education.

Trainer Note

A case study exercise offered in Handout 36C (Case Studies) is an alternative to the visual aids activity or an additional application exercise which could be done by the group at the end of Step 2 or at the very end of the session.

If you do use the case study:

- Have the large group break into 4-5 small working groups (no more than five participants) and distribute Handout 36C (Case Studies). Ask the groups to read these studies and answer the questions.

- Reconvene the large group and have them briefly discuss their findings and the reasons for their answers.

Two or three groups should be given the same case study to analyze; if their diagnosis and answers differ, the groups should be encouraged to discuss their differences and to come to a consensus on their answers. In the event the correct diagnosis was not made, present it. The answers to these case studies are found in Trainer Attachment 36B (Case Studies Answer Sheet).

COMMON CHILDHOOD DISEASES

____
(NAME OF DISEASE)

AGE AT ONSET	
INFECTIOUS AGENT	
MODE OF TRANSMISSION	
MAJOR SIGNS SYMPTOMS & COMPLICATIONS	
TREATMENT	
METHOD OF PREVENTION AND CONTRAINDICATION	

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COMMON CHILDHOOD DISEASES

MEASLES

AGE AT ONSET	Usually 5 and under
INFECTIOUS AGENT	Virus
MODE OF TRANSMISSION	Droplet spread or direct contact with nasal or throat secretions of infected person.
MAJOR SIGNS SYMPTOMS & COMPLICATIONS	Illness begins with fever, cough, runny nose and redness of the eyes. The mouth becomes sore. The fever peaks after 4-5 days. On the 3rd-4th day of illness a bumpy red rash (Violet-colored in many African children) appears on the head and spreads to the legs. It heals with scaling and does not usually last longer than a week. The most common complication of measles are middle ear infection, pneumonia, and diarrhea, which can lead to dehydration and/or malnutrition.
TREATMENT	Diarrhea with dehydration and/or malnutrition and pneumonia are the two most common causes of measles associated with deaths of children. Fluids and good nutrition can help prevent death from diarrhea and antibiotics can be used to treat some cases of pneumonia. There is no cure, however for the measles infection itself.
METHOD OF PREVENTION AND reasons CONTRAINDICATION	Measles immunization in U.S. 1 dose after 15 months of age. In Africa, 1 dose at 9 months of age. No contra-indications. Mild fever, colds and diarrhea are not to postpone immunizations.

COMMON CHILDHOOD DISEASES

NEONATAL TETANUS

AGE AT ONSET	4-21 days old
INFECTIOUS AGENT	Bacterium
MODE OF TRANSMISSION	Tetanus spores are usually introduced into the body by the instrument used to cut the umbilical cord, or through infection of the unhealed umbilicus when it comes into contact with contaminated substances.
MAJOR SIGNS SYMPTOMS & COMPLICATIONS	Muscle spasms, lockjaw, 4-21 days after birth. Stops feeding at the breast.
TREATMENT	Treatment is not effective unless carried out in a well equipped hospital. Even then 40-60% of the infants with this disease die.
METHOD OF PREVENTION AND CONTRAINDICATION	For neonatal tetanus give two doses of tetanus toxiod 4 weeks apart to pregnant women if they have never been vaccinated. The initial dose should be given as early in pregnancy as practical. The second injection should be given at least 4 weeks later and preferably at least 3 weeks before delivery. If the second dose is not given then, be sure it is given at a post-natal visit (4 weeks later). During each subsequent pregnancy, the general principle is to give 1 booster dose. After 5 well documented immunizations with tetanus toxoid, the need for subsequent doses is very small. Neonatal tetanus can also be prevented by hygenic care of the umbilical cord.

COMMON CHILDHOOD DISEASES

PERTUSIS

AGE AT ONSET	The age of onset in children who live in densely populated urban areas, where whooping cough is endemic is usually less than 1 year. In rural communities where the disease usually occurs in epidemics, children throughout the 0-4 age range become ill.
INFECTIOUS AGENT	Bacterium
MODE OF TRANSMISSION	Droplet spread; direct contact with discharges from respiratory mucous membrane of children.
MAJOR SIGNS SYMPTOMS & COMPLICATIONS	Cattarrhal Period - Lasts 7-14 days. Cough and nasal discharge are present. Paroxysmal Period - Lasts, as a rule, 4-6 weeks. Bursts of coughing with no intake of breath are followed by a sudden inspiration with a characteristic "whoop" (though the "whoop" is sometimes not present, particularly in infants less than 6 months of age). These coughing spells produce sticky sputum and are often followed by vomiting. Whooping cough is associated with loss of appetite. It may lead to malnutrition.
TREATMENT	Antibiotics (of value only during incubation period) and nursing care can reduce the severity of some cases.
METHOD OF PREVENTION AND CONTRAINDICATION	DTP immunization given as soon as possible after 6 weeks of birth followed by 2 or more doses spread at least 4 weeks apart. This vaccine should not be given to a child who has had convulsions, encephalitis or shock associated with previous injections of this vaccine.

COMMON CHILDHOOD DISEASES

PARALYTIC POLIO

AGE AT ONSET	Under three years
INFECTIOUS AGENT	Virus
MODE OF TRANSMISSION	Fecal-oral is the major route of transmission where sanitation is poor. During epidemics and where sanitation is good droplet spread is more important.
MAJOR SIGNS SYMPTOMS & COMPLICATIONS	Fever, stiff neck and sudden weakness of arm or leg. Senses of touch and pain are normal.
TREATMENT	Following an acute attack of polio, the patient should exercise the muscles he does have. Do not give injections to patients suffering acute stages of polio. There is no cure for the infection itself.
METHOD OF PREVENTION AND CONTRAINDICATION	The primary series of oral polio vaccine consists of 3 oral doses. The recommended age of 1st dose is as soon as possible after the child reaches 6 weeks of age. The minimum recommended interval between doses is 4 weeks. There are no contraindications. If a child is given polio vaccine during an episode of diarrhea an additional dose of vaccine should be given 4 or more weeks later.

COMMON CHILDHOOD DISEASES

CHILDHOOD TUBERCULOSIS

AGE AT ONSET	Variable
INFECTIOUS AGENT	Bacteria
MODE OF TRANSMISSION	Exposure to bacilli in airborne droplet from sputum of person with infectious tuberculosis. Transmission in children is usually associated with close exposure to infectious cases.
MAJOR SIGNS SYMPTOMS & COMPLICATIONS	Productive cough, loss of weight, fever, general weakness.
TREATMENT	Use of INH. Good nutrition.
METHOD OF PREVENTION AND CONTRAINDICATION	BCG vaccination at birth.

COMMON CHILDHOOD DISEASES

YELLOW FEVER

AGE AT ONSET	Variable
INFECTIOUS AGENT	Group B Togo virus
MODE OF TRANSMISSION	In urban and certain rural areas, by the bite of infective Aedes aegypti mosquitoes.
MAJOR SIGNS SYMPTOMS & COMPLICATIONS	The mildest cases are clinically indeterminate. Typical attacks begin with sudden onset, and are characterized by fever, headache, backache, prostration, nausea and vomiting. As the disease progresses, the pulse slows and weakens, though the temperature may be elevated. Jaundice is moderate early in the disease and is intensified later.
TREATMENT	Symptomatic
METHOD OF PREVENTION AND CONTRAINDICATION	Vaccination with Yellow Fever Vaccine 17-D. Not recommended for children less than 1 year of age.

CASE STUDIES

Name of Patient	Djogdum, Paul	
Sex	Male	
Date of Birth:	7 November 1975	
Date of Visit	18 April 1980	
Vital Signs:	Temperature	37.7°C
	Pulse	95
	Respirations	28
	Weight	15.7 kg

Presenting Complaint and Medical History:

The boy's mother says her child has had a chest cold for the past week and that now he has begun to have attacks of coughing. He coughs up thick, sticky white mucus. Sometimes his food comes up after an attack. The cough ends with a high noise. The coughing attacks exhaust him.

The boy was full term, normal delivery. At birth he weighed 2.9 kg. He had measles at four years of age.

The mother did not bring the boy's immunization record with her.

Physical Examination:

The boy looks strong but tired. His mucous membranes are pink, his tongue is pink and moist, his sclera is clear. His face is slightly red. His lymph glands are not swollen. An occasional rhonchi can be heard in his chest.

The child had two attacks of coughing during the examination. The cough is short and sharp. He coughs up sticky white mucus. Inspiration after coughing is harsh.

Study the information given above, then answer these questions.

1. What is the diagnosis?
2. What information in the case study was most useful to you when you made your diagnosis?
3. Was any information missing from the case study that would have helped you make the diagnosis?
4. How would you treat this patient?
5. What advice would you give this patient?

Name of Patient:	SY, Awa	
Sex:	Female	
Date of Birth:	2 May 1977	
Date of Visit:	1 April 1981	
Vital Signs:	Temperature	39.5°C
	Pulse	120
	Respirations	33
	Weight	17.1 kg

Presenting Complaint and Medical History:

The child has had a fever and bad cold for the last three days.

Child developed a head cold about three days ago. It has been getting worse. This morning she developed a high fever. Her eyes are red. She is tired and irritable. She will not eat. She has had no chills or fits.

The young girl has had no previous serious illness. She is the second of four children. The other children are all well.

Physical Examination:

Child looks ill and irritable. Her conjunctivae are red. Her tongue is dry and coated. Her throat is red. No exudate is on her tonsils. She has small white spots with red borders on the mucous membranes of both cheeks. A chest exam reveals some rhonchi, but no respiratory distress or signs of pneumonia. Her abdomen is soft and not tender. No organ enlargement is noted. Her skin is clear except for a red rash on her neck. Many macules and papules, but no pustules are visible.

Study the information given above, then answer these questions.

1. What is the diagnosis?
2. What information in the case study was most helpful to you when you made your diagnosis?
3. Was any information missing from the case study that would have helped you make the diagnosis?
4. How would you treat this patient?
5. What advice would you give this patient?

(From: MEDEX. *Primary Health Care Series, Maternal and Child Health.* Student Text. pp. 94-96.)

TRAINERS GLOSSARY

In the event that the volunteers have difficulty understanding certain terms in this session, the following definitions/explanations should be provided:

Infectious Agent	The organism that must be present for a disease to occur. The agents are usually located in the biological environment.
Mode of Transmission	Any mechanism by which an infectious agent is spread through the environment or to another person. These mechanisms are: - Direct Transmission - Indirect Transmission 1. Vehicle-borne 2. Vector-borne 3. Airborne

(From: Benenson, Control of Communicable Diseases in Man.)

EPIDEMIOLOGY: DEFINITION AND BASIC RATES

The study of a community is not complete without data on the principal diseases which affect it. Planning of curative and preventive programmes, especially health education, must be based on accurate knowledge of the existence and the importance of the different diseases in the community. For this reason, the nurse must know how to collect basic epidemiological data.

Epidemiology is the study of the diseases that exist in a population. It describes the factors arising from the agent (vector), the host itself and from the reservoir (natural source of the infection) which contribute to the transmission and survival of a disease in a population. Epidemiology is based on disease surveillance in the community. It can be a means for measuring the impact of the nurse's activities on the health of the community through the annual calculation of disease incidence and prevalence rates. What do these terms mean?

Incidence Rate: This is the rate of new cases of a disease to appear in a population during a given period of time. Usually it is expressed per 100,000 inhabitants for one year, according to the following formula:

$$\text{Incidence Rate} = \frac{\text{Number of new cases appearing in one year} \times 100{,}000}{\text{The total population counted on the middle day of the year (July 1st).}}$$

Example: If in a village of 5796 inhabitants, between January 1 and December 31 there were 60 new cases of viral hepatitis, one would have an

$$\text{Incidence rate} = \frac{60}{5796} \times 100{,}000 = 1030 \text{ cases}/100{,}000 \text{ per year.}$$

Prevalence Rate: represents the number of cases of a certain disease existing in a population *at the time of the study.* This figure is usually expressed per 100,000 persons.

$$\text{Point Prevalence Rate} = \frac{\text{Number of cases at the time of the study} \times 100{,}000}{\text{Population studied}}$$

Example: If at a certain moment, in the same village of 5796 inhabitants there were 110 persons who were suffering from bilharzia, one would have a

$$\text{Prevalence Rate} = \frac{110}{5796} \times 100{,}000 = 1898 \text{ per } 100{,}000$$

Knowing how to calculate the incidence and prevalence rates of disease, the nurse should then be able to ask himself: What are the principal diseases for which members of the community come to the health centre for consultation? What is the frequency of various diseases in the population? Are they more frequent at different times of the year, in particular areas or neighbourhoods, or among particular groups: children, pregnant women, elderly people? What are the *endemic diseases* in the community, i.e., the diseases that constantly scourge the population of the region? Are there *epidemics,* i.e., diseases which affect a large number of the population acutely at the same time?

(From: Colgate, S. et. al., The Nurse and Community Health in Africa. pp. 38-39)

TABLE 9–1 Major Public Health Rates

Rates	Usual Factor	Rate for United States, 1971
Rates Whose Denominators Are the Total Population		
Crude birth rate = $\frac{\text{number of live births during the year}}{\text{average (midyear) population}}$	per 1,000 population	17.2 15.7‡ (1973, preliminary)
Crude death rate = $\frac{\text{number of deaths during the year}}{\text{average (midyear) population}}$	per 1,000 population	9.3 9.4‡ (1973, preliminary)
Age-specific death rate = $\frac{\text{number of deaths among persons of a given age group in a year}}{\text{average (midyear) population in specified age group}}$	per 1,000 population	5–14 years – 0.4 65–74 years – 35.9
Cause-specific death rate = $\frac{\text{number of deaths from a stated cause in a year}}{\text{average (midyear) population}}$	per 100,000 population	Diseases of the heart – 359.5 Malignant neoplasms – 163.2
Rates and Ratios Whose Denominators Are Live Births		
Infant mortality rate = $\frac{\text{number of deaths in a year of children less than 1 year of age}}{\text{number of live births in same year}}$	per 1,000 live births	19.1 17.6‡ (1973, preliminary)

Rates	Usual Factor	Rate for United States, 1971
Neonatal mortality rate = $\frac{\text{number of deaths in a year of children } < 28 \text{ days of age}}{\text{number of live births in same year}}$	per 1,000 live births	14.2
Fetal death *ratio* = $\frac{\text{number of fetal deaths** during year}}{\text{number of live births in same year}}$	per 1,000 live births	13.4
Maternal (puerperal) mortality rate = $\frac{\text{number of deaths from puerperal causes in a year}}{\text{number of live births in same year}}$***	per 100,000 (or 10,000) live births	18.8 per 100,000
RATES WHOSE DENOMINATORS ARE CASES OF THAT DISEASE		
Case Fatality rate = $\frac{\text{number of deaths from a disease}}{\text{number of cases of that disease}}$	%	Measures Disease Severity
Rates Whose Denominators Are Live Births and Fetal Deaths		
Fetal death rate = $\frac{\text{number of fetal deaths** during year}}{\text{number of live births and fetal deaths during same year}}$	per 1,000 live births and fetal deaths	13.3
Perinatal mortality rate† = $\frac{\text{number of fetal deaths 28 weeks or more and infant deaths under 7 days of age}}{\text{number of live births and fetal deaths 28 weeks or more during the same year}}$	per 1,000 live births and fetal deaths	27.6

*From National Center for Health Statistics: Vital Statistics of the United States. Vol. I and II. U.S. Govt. Printing Office. Washington D.C., 1974.

**Includes only fetal deaths for which period of gestation was 20 weeks or more or was not stated. (U.S. definition. Other countries may include deaths prior to the complete expulsion of extraction from its mother of a product of conception)

†This rate is for Perinatal Period I fetal deaths occurring 28 weeks or later and includes only deaths during the first week following birth)

‡Monthly Vital Statistics Report 22:12, U.S. Govt. Printing Office, Washington, D.C., 1974.

***The denominator consists only of live births because registration is more complete for live births than fetal deaths. If this were a true rate, however, the denominator should include all pregnancies.

(From: Mausner and Bahn. Epidemiology: An Introductory Text. Chapter 9.)

CASE STUDIES ANSWER SHEET

Name of Patient: Djogdum, Paul

Sex: Male

Date of Birth: 7 November 1975

Date of Visit: 18 April 1980

Vital Signs:

Temperature	37.7°C
Pulse	95
Respirations	28
Weight	15.7 kg

Presenting Complaint: The boy's mother says her child has had a chest cold for the past week and that now he has begun to have attacks of coughing. He coughs up thick, sticky white mucus. Sometimes his food comes up after an attack. The cough ends with a high noise. The coughing attacks exhaust him.

Medical History: The boy was a full term, normal delivery. At birth he weighed 2.9 kg. He had measles at four years of age.

The mother did not bring the boy's immunization record with her.

Physical Examination: The boy looks strong but tired. His mucous membranes are pink, his tongue is pink and moist, his sclerae are clear. His face is slightly red. His lymph glands are not swollen. An occasional rhonchi can be heard in his chest.

The child had two attacks of coughing during the examination. The cough is short and sharp. He coughs up sticky white mucus. Inspiration after coughing is harsh.

Diagnosis: Whooping cough

Patient Care:

1. Increase the number of meals you feed the boy each day. Give him smaller portions at each meal.
2. Give him 50 mg ampicillin per kilogram of body weight in divided doses every six hours.

Diagnostic Point: Cough with whoop

Name of Patient: SY, Awa
Sex: Female
Date of Birth: 2 May 1977
Date of Visit: 1 April 1981

Vital Signs:

Temperature	39.5°C
Pulse	120
Respirations	33
Weight	17.1 kg

Presenting Complaint and Medical History:

The child has had a fever and bad cold for the last three days.

Child developed a head cold about three days ago. It has been getting worse. This morning she developed a high fever. Her eyes are red. She is tired and irritable. She will not eat. She has had no chills or fits.

The young girl has had no previous serious illness. She is the second of four children. The other children are all well.

Physical Examination:

Child looks ill and irritable. Her conjunctivae are red. Her tongue is dry and coated. Her throat is red. No exudate is on her tonsils. She has small white spots with red borders on the mucous membranes of both cheeks. A chest exam reveals some rhonchi, but no respiratory distress or signs of pneumonia. Her abdomen is soft and not tender. No organ enlargement is noted. Her skin is clear except for a red rash on her neck. Many macules and papules, but no pustules are visible.

Diagnosis: Measles

Patient Care:

1. Teach the parents how to sponge the child to bring the fever down. Follow these steps:
   a. Obtain bowl with water at room temperature.

b. Undress the child to her underpants.

c. Have the child lie down on a bench or table or bed.

d. Obtain a sheet or towels and put them into the bowl of water. Wring them out and place them over the child, including her head. Leave them there for two to three minutes.

e. Put the sheet or towel back into the bowl of water.

f. Continue this procedure until the temperature is reduced.

You may also give the parents aspirin to bring the child's temperature down.

2. Give one tablet aspirin every four to six hours for fever.
3. Give the child frequent small meals. Between meals, encourage her to drink fruit juice or water.
4. Ask the mother to contact the clinic daily. If the child's fever remains high for more than one more day, or if she begins to have difficulty breathing, the mother should bring her back to the clinic.

Diagnostic Points:

1. Combination of fever, red eyes, runny nose, and cough, and the early development of rash on neck which is characteristic of measles
2. Spots on inside of cheeks

(From: MEDEX. Primary Health Care Series, Maternal and Child Health. Instructor's Manual. Vol. 24, Teaching Plan 10. pp. 54-56.)

Session 37

TRANSMISSION OF IMMUNIZABLE DISEASES

TOTAL TIME 3 hours

OVERVIEW

Session 37 is the second of a three-part series of sessions which deals with the control of specific immunizable diseases. Here participants gain technical information regarding ways in which diseases are spread. They also learn how the local culture views the ways in which these diseases are spread and then practice giving advice that merges the two perspectives.

OBJECTIVES

- To explain modes of transmission and infectious agents for each of the diseases.
(Step 1)
- To formulate health messages that incorporate accurate technical information and cultural beliefs and perspective.
(Step 2, 3)
- To begin planning and developing materials for a puppet show and picture series.
(Step 4)

RESOURCES

- Helping Health Workers Learn (pp. 22-26)
- "Audio-Visual/Communications Teaching Aids" (Peace Corps Resource Packet p-8)

Handout:
- 36B Answers to Childhood Diseases Chart (from Session 36)

MATERIALS

Newsprint, markers, materials for making puppets and props for a puppet show, paper, pens, cassette recorder, tapes of local music.

PROCEDURE

Trainer Note

This session will require considerable preparation. The principal activity of this session is developing health education lessons using puppets and pictures. In order to utilize the limited time given the volunteers for this activity, you should obtain and develop the following props in advance:

- Cloth to serve as a stage covering
- Sticks, Cardboard and Colored Markers if you choose to make stick puppets.
- Vegetables, Carving Knives and Other Materials (leaves, grass, rope and cloth to make hand puppets.
- Glue
- Table which serves as a stage or a pre-fab puppet stage.
- Tape Recorder and Local Music
- Pictures developed in-country or by international organizations of one or several of the diseases covered in the session.

Step 1
(15 min)

Understanding How Diseases Are Spread

Have the group review the answers under the column headings "Mode of Transmission" and "Infectious Agent" from Handout 36B (Answers to Childhood Disease Chart). Ask them if they have any questions pertaining to these two categories. Discuss these questions and any misperceptions with them.

Step 2
(25 min)

Cultural Factors Affecting the Spread of Disease

Have participants divide into small groups and distribute a written cultural belief description to each group (see Trainer Note below). Ask them to study the belief and then develop a short story (2 minutes) which incorporates the local cultural beliefs with technical health advice regarding the cause and spread of disease. Read them the story provided in the Trainer Note as an example.

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Trainer Note

You will need to find out about some local beliefs on how diseases are spread and distribute this information in a handout to the small groups. An example of a story based on local beliefs, that you may choose to present yourself or use as a working example to aid the volunteers in their project, is the following:

> "Midwives in Lardin Gabas traditionally rub dry dirt or cow dung into the end of a baby's cord to prevent bleeding. The result is that babies often die of tetanus from the infection that enters through the cord. But people think the illness is caused by a certain kind of bird that lands above the baby. They believe that when the bird sings, the spirit of the baby flows out through the cord, causing the baby's body to stiffen with spasms."

The story the health workers would tell to the people describes how a village midwife learned to prevent this form of infant death. After carefully washing her hands, she would tightly tie the baby's cord with clean strips of cloth, then cut it with a boiled bamboo knife. Later, when the bird landed over the baby and sang, the baby's spirit could not escape because the cord was tightly tied. (From: Helping Health Workers Learn, Chapter 22, p.6).

Step 3 (35 min) **Presentation and Discussion of the Stories**

Reconvene the large group and ask each group to present their story. After each story, have the group discuss its strengths and weaknesses.

Trainer Note

The following are a few examples of questions that can serve as discussion areas. (Based on the story from Lardin Gabas).

- In what ways does this story help mothers and midwives gain greater understanding and learn healthier practices?
- In what ways does the story mislead or block their understanding of important causes of diseases?
- Which is more likely to help people gain control of the events that affect their health and lives, a magical or scientific understanding of causes and results?
- Does the story focus solely on the weaknesses of a local custom and the beneficial ways or strengths of modern (outside) ways?

(From: Helping Health Workers Learn, Chapter 22, p. 6)

15 Minute Break

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Step 4 **(90 min)**

Preparing a Health Education Lesson

Inform the participants that in this step they will begin to develop a health education lesson, using either puppets or a picture series (e.g. flipcharts, flannelgraphs), to communicate to mothers or school children the importance of timely and complete immunizations for children under the age of five.

Ask them to form two groups. One group to develop a puppet show and the other to develop a heatlh talk using pictures. Tell them they have the rest of this session (90 minutes) and part of the next session to work.

Trainer Note

Tell the group preparing the picture/flipchart presentation that their target audience will consist of mothers attending a health education class. The group preparing the puppet show should be told to aim their presentation towards school children aged 8-12 years.

Inform them that the objectives of their presentations are to convey important information on childhood illnesses that they think would motivate members of the community to adopt beneficial health practices. Some of the information they should include in their presentations on the prevalent immunizable diseases in their country are:

- signs and symptoms of the diseases
- modes of transmission
- methods of prevention

Tell them that staff members and other outside guests will be invited to attend their presentations. Give the prearranged time and date (Session 38).

Session 38

PREVENTING AND CONTROLLING THE SPREAD OF DISEASE

TOTAL TIME 3 hours

OVERVIEW As the last in the series of sessions on immunizable diseases, Session 38 focuses on preventing disease through primary, secondary, and tertiary interventions. Participants examine the WHO and host country immunization schedule. Then they complete the final preparation on their puppet show or picture series and make their presentations.

OBJECTIVES

- To compare the WHO and the host country immunization schedules.
(Step 2)
- To design and conduct a puppet show and picture (flip chart) series that deal with the issues of immunizable disease studied during Sessions 36, 37, and 38.
(Steps 4, 5)

RESOURCES Technical Health Training Manual (Peace Corps)

Handouts:
- 36B Answers to Childhood Diseases Chart
(from Session 36)
- 38A "MOH Immunization Schedule"
(to be prepared by trainer)

Trainer Attachment:
- 38A Levels of Prevention

MATERIALS Newsprint, markers, materials and props for the puppet show; room, chairs, stage, etc. for presenting the puppet show and picture series.

PROCEDURE

Trainer Note

In advance of this session invite Host Country Nationals, language trainers, etc. to attend the health education presentations. Inform the participants of the date and time that these invited guests will be arriving.

Step 1 (15 min) **Method of Preventing Disease**

Once more, ask the group to look at Handout 36B (Answers to Childhood Diseases Chart) and to study the information under the column headings "Method of Prevention and Contraindications" and "Treatment." Ask the participants if they have any questions or need for clarifications.

Step 2 (25 min) **Country Specific Immunization Schedule**

Distribute a copy of Handout 38A, (MOH Immunization Schedule) to each participant. Have them review this schedule and compare it with the WHO recommended schedule as presented in Handout 36B. Discuss any differences that might occur between these two schedules.

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Trainer Note

What is essential to stress about the immunization schedule listed in Handout 36B (Answers To Childhood Diseases Chart) is that this schedule lists the minimal age for the first dose and the minimal interval between successive doses recommended by the World Health Organization. Based on these recommended minimums, countries may develop an immunization schedule that gives different ages for receiving the first dose of vaccine. It is important that volunteers follow the vaccination schedule of the host country. This as well as the following points and other factors that you the trainer may be aware of concerning country-specific schedules should be discussed:

- Logistical reasons, i.e., shortage of health personnel, facilities, transportation and equipment.
- Medical philosophies, e.g., physicians believe that maternal antibodies for certain diseases may interfere with a child's development of protective antibodies. Therefore, the child will need to be revaccinated, which is not cost-effective.
- Political reasons, e.g., WHO recommendations are not accepted by the MOH.
- Selection of injectable polio vaccine instead of oral polio vaccine.

Step 3
(20 min)

Defining Levels of Prevention

Based on the information presented in Trainer Attachment 38A ("Levels of Prevention") present a brief lecturette defining in general the three levels of prevention.

Trainer Note

This presentation should emphasize primary prevention via immunization. Discussion of secondary prevention should incorporate the treatment section of Handout 36B (Answers To Childhood Diseases Chart) and include the local remedies or treatments. Tertiary prevention pertains mainly to residual paralysis from contracting polio.

10 Minute Break

Step 4
(60 min)

Final Preparation for Presenting the Puppet Show

Have the participants divide into the two groups they formed at the end of Session 37. Ask them to incorporate the new information they've gained in this session into their scripts and to finalize any other materials and methods that they will use in their show. Tell the groups they have the rest of the session to finish their presentation preparations.

Trainer Note

The trainer and participants should pre-arrange the time of the health presentations. Whether it happens immediately at the close of the session or later in the evening will depend on your particular situation.

Prior to curtain time prepare some after show refreshments and make sure seating is arranged for the invited guests. Also, ask a member of the group to serve as "emcee" for the activities.

Step 5
(xx min)

Present the Health Education Lessons

Ask the emcee to welcome the guests and have one member of each team describe the setting and target groups for whom the show/lessons were developed, i.e., mothers or school-age children. At the end of the presentations, have the emcee thank the audience for coming and invite them to stay for refreshments which are in the "lobby."

Trainer Note

Either after the guests have gone, or at the beginning of the next morning's session, ask participants to process the experience of designing and implementing the health shows. Be sure they discuss how they felt their presentations went and what suggestions for improvement and/or change they would advise. Ask them to discuss how useful they think these techniques are for presenting health education information.

LEVELS OF PREVENTION

With *prevention* a dominant theme, it may be well to elaborate upon this word. In a narrow sense, prevention simply means inhibiting the development of a disease before it occurs. However, in current usage, the term has been extended to include measures which interrupt or slow the progression of disease. For this reason several levels of prevention are said to exist. *Primary* prevention (appropriate in the stage of susceptibility) is prevention of disease by altering susceptibility or reducing exposure for susceptible individuals; *secondary* prevention (applied in early disease, i.e., preclinical and clinical stages) is the early detection and treatment of disease; *tertiary* prevention (appropriate in the stage of advanced disease or disability) is the alleviation of disability resulting from disease and attempts to restore effective functioning.

Primary Prevention

Prevention of the occurrence of disease consists of measures which fall into two major categories: general health promotion and specific protective measures. *General health promotion* includes provision of conditions at home, work, and school which favor healthy living, e.g., good nutrition, adequate clothing, shelter, rest, and recreation. It also encompasses the broad area of health education, which includes not only instruction in hygiene, but also such diverse areas as sex education, anticipatory guidance for children and parents, and counselling in preparation for retirement. *Specific protective measures* include immunizations, environmental sanitation (e.g., purification of water supplies), and protection against accidents and occupational hazards.

The past successes of public health in developed countries have been accomplished largely by primary prevention of infectious disease through environmental manipulation and immunization. The most pressing unsolved problems in these countries today are chronic diseases whose prevention requires modification of deeply-rooted individual behavior, such as dietary patterns, physical activity, and the use of alcohol, tobacco, and other drugs. Equally obdurate and important is the problem of deaths and injuries from accidents, especially motor vehicle crashes. Future efforts at primary prevention of these conditions will probably focus both on attempts to influence individual behavior and on environmental controls (e.g., air-bags in cars, altered composition of dietary fats) which will in part shift health-related decisions from the individual to social institutions.

Secondary Prevention

With early detection and prompt treatment of disease, it is sometimes possible to either cure disease at the earliest stage possible or slow its progression, prevent complications, limit disability, and reverse communicability of infectious diseases. On a community basis, early treatment of persons with infectious diseases (e.g., venereal infections) may protect others from acquiring infection and thus provides at once secondary prevention for the infected individuals and primary prevention for their potential contacts. Examples of diseases in which efforts at control center primarily around secondary prevention are diabetes, *in situ* carcinoma of the cervix, and glaucoma.

As is true of primary prevention, secondary prevention is a responsibility of both physicians in private practice and those in community posts. Health departments and other community agencies often conduct screening surveys in which asymptomatic persons are tested to uncover disease in its early stages.

Tertiary Prevention

This consists of *limitation of disability* and *rehabilitation* where disease has already occurred and left residual damage. Physiotherapy to an affected limb to restore motion and prevent contractures exemplifies measures for the limitation of disability.

Rehabilitation is the name given to attempts to restore an affected individual to a useful, satisfying, and, where possible, self-sufficient role in society. Its major theme is maximal utilization of the individual's residual capacities, with emphasis on his remaining abilities rather than on his losses. Since modern rehabilitation includes psychosocial and vocational as well as medical components, it calls for good teamwork by people from a variety of professions, as shown in Figure 1-1. It may also require extensive physical facilities and sufficient funding to provide a variety of services over a prolonged period of time.

Until the occurrence of death, it may be possible at each stage of the evolution of a disease process to apply appropriate measures to prevent continued progression and deterioration of the patient's condition. The different levels of prevention can be fully understood only in relation to the natural progression or natural history of disease. The clearer our understanding of the natural history of a disease, the greater may be the opportunities for developing effective points of intervention. The interrelations between natural history and levels of prevention will be illustrated by a specific example, stroke.

(From: Mausner and Bahn. Epidemiology: An Introduction Text. pp. 9-11)

SESSION 39

DEHYDRATION ASSESSMENT

TOTAL TIME 2 hours

OVERVIEW

Specific checklists and charts that summarize "what to look for" help participants more accurately identify potential dehydration resulting from diarrhea.

In this session participants identify the visual signs and symptoms of dehydration resulting from diarrhea. Using the WHO Diarrhea Treatment Chart, they assess the signs of dehydration presented in case studies and determine the appropriate treatment plan to follow for severity and degree of dehydration. They close the session with a review of what they have learned and an optional discussion of how to adapt the treatment chart for use in the village.

OBJECTIVES

- To identify physical signs of dehydration. (Steps 1, 2)
- To use the WHO Diarrhea Treatment Chart to assess patients for signs of dehydration and to determine appropriate treatment plans. (Steps 4-6)

RESOURCES

Handouts:
- 39A Introduction to Treatment of Diarrhea
- 39B Assessing Children with Diarrhea
- 39C WHO Diarrhea Treatment Chart
- 39D Diarrhea and Dehydration Case Assessments

Trainer Attachments:
- 39A Pictures of Children with Some Signs of Dehydration (to be developed by trainer)
- 39B Guidelines for Presentation of WHO Treatment Chart
- 39C Case Studies for the Treatment of Diarrhea

MATERIALS Slide viewing equipment; slides and/or pictures of children with physical signs of dehydration; poster-size version of WHO Diarrhea Treatment Chart; newsprint and markers; plastic bag, water and gourd baby.

PROCEDURE

Trainer Note

Prior to this session, the trainer should obtain photos or slides of children who exhibit some of the following signs of dehydration:

dry cracked lips
slightly sunken eyes
inelastic skin (pinched skin does not respond after two seconds)
weight loss
sunken fontenelle
sad listless appearance

Also obtain a copy of the WHO poster-size Diarrhea Treatment Chart (available from either the WHO country coordinator or local UNICEF representative).

One or two days before this session, ask a participant with some health background, to prepare the presentation for Step 3. The information they should include in their presentation is found in Handouts 39 A-C. Suggested guidelines for this presentation are found in Trainer Attachment 39B. Go over these guidelines and handouts with the participant prior to this session.

Please note that Handouts 39 A-D are from the WHO CDD Supervisory Skills Module entitled "Treatment of Diarrhea". Since this module is included in the Trainees resource packet, reproduction of the handouts isn't necessary.

If more information on diarrheal diseases is needed, please refer to the Peace Corps training manuals on Oral Rehydration Therapy and Combatting Childhood Communicable Diseases.

Step 1
(20 min)

Dehydration Picture Gallery

Post the pictures or show the slides of children who exhibit some of the signs of dehydration. Ask the participants to examine the pictures/slides and to individually record the physical symptoms they observe. In addition, have participants jot down in descriptive terms how each of the children appears to feel (e.g., lethargic, inactive). Instruct participants not to talk with each other while they are making their notes.

Step 2 (20 min)

Discussion of Observations in Pictures

Hold up or show the pictures/slides of dehydrated children one at a time and ask the participants to share their recorded observations. Write their response on newsprint and post the appropriate picture next to it.

Summarize the signs observed and discuss the limitations of looking alone. Note the signs that require asking and feeling.

TRAINER NOTE

If any of the visible signs as stated in Handout 39B (Assessing Children with Diarrhea) and Handout 39C (WHO Diarrhea Treatment Chart) were not stated, be sure to mention and record them after the picture has been shown and the participants observations have been noted.

Some of the participants' observations may relate more to malnutrition, vitamin deficiencies and/or certain infectious diseases than to dehydration. While the children in the photos may indeed be suffering from these conditions, the purpose here is to concentrate on and discuss only the symptoms of dehydration. Module 5 as well as other sessions in this module contain specific sessions which discuss these other interrelated conditions in detail.

Step 3 (20 min)

Introducing the WHO Chart

Post a copy of the large WHO Diarrhea Treatment Chart in front of the room along with the definitions of diarrhea and dehydration that are found in the Trainer Note below. After the group has had a chance to look over the chart and definitions, ask the pre-selected participant to present and explain how to use the chart as an assessment tool. Allow time for any questions or concerns the group may have before moving on to the next step.

Trainer Note

Simply defined:

Diarrhea is a disease characterized by frequent passage of abnormally loose or watery stools.

Dehydration is loss of a large amount of water and salt from the body.

Acute Diarrhea is characterized by three or more abnormally loose or watery stools per day for three weeks or less and is caused by an infection of the bowel.

Chronic Diarrhea is characterized by diarrhea lasting more than three weeks and is caused by an infection of the bowel, under-nutrition or by worms and other parasites.

As mentioned earlier, the trainer should help the presenter prepare his or her explanations of the WHO Chart. Use the guidelines offered in Trainer Attachment 39B as a basis for developing a complete presentation.

Step 4
(20 min)

Practice Assessment of Diarrhea and Dehydration

After the introduction of the chart, distribute Handout 39C (WHO Diarrhea Treatment Chart) and Handout 39D (Diarrhea and Dehydration Case Assessments). Have the participants form small groups to work through the exercises and write their answers on a sheet of paper. Suggest that they review the pictures of children with signs of dehydration to help them complete the assessment exercises more easily.

Tell them to only answer the questions pertaining to the assessment of the cases and to hold their answer for treatment until later.

Trainer Note

If participants have a copy of the WHO Supervisory Skills Treatment of Diarrhea, tell them to look at the WHO chart on pages 12 and 13 and do the exercises on pages 28-31.

Step 5 (20 min)

Comparison and Discussion of Assessments

Reconvene the group. Assign each group the task of reporting and discussing the answers for one case study. The reports should include explanations of the assessment process. Depending on the number of small groups and number of exercises, some groups may have to report on more than one case. Allow time for questions and discuss any differences of opinion or conflicting answers. Also discuss any difficulties encountered in using the WHO chart, and encourage participants to help each other solve these problems.

Step 6 (20 min)

Treatment of Diarrhea and Dehydration

Using Trainer Attachment 39C (Case Studies for the Treatment of Diarrhea) describe to the group two sample cases of dehydration. Tell participants to review their WHO Treatment Charts and describe the kind of treatment required in each case. Have the group identify specifically what the health worker should do and what the health worker should tell the mother to do in each of the cases.

TRAINER NOTE

For the case using Treatment Plan A, the following rules for home treatment should be stressed:

- Increase fluids
- Continue feeding (food should be offered 5-7 times a day).
- Look for signs of dehydration.
- Give the sugar-salt or ORS solution (if available) every time the child has a loose stool and if the child vomits wait 10 minutes and then continue to give solution in small amounts.
- The mother should go to a clinic if diarrhea persists for longer than 2 days or at the first signs of dehydration.

Emphasize that Treatment Plan A is extremely important and that if begun at the first sign of diarrhea and mixed correctly this treatment may prevent dehydration.

Continued

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The main points to underscore in Treatment Plan B are:

- The amount to give depends on the child's weight or age.
- The child's status should be reassesed after 4-6 hours of treatment.
- This plan should be followed if the child shows two or more signs of dehydration.

In both cases the participants should understand that the solutions should not be kept more that 12 hours. Also, that their role for the most part will be in explaining to mothers how to make and when to give sugar-salt solution and when children should be referred to health centers for treatment with ORS packets.

Step 7
(30 min)

Case Studies

Ask the participants to go back to the case studies from Step 4 and individually answer the questions which refer to treatment using the WHO Treatment charts and what they've learned from the previous step.

Give them 15 minutes then ask for volunteers to read their answers. Discuss any differences or difficulties the group encountered in using the chart.

Step 8
(10 min)

Review of the Session

Ask a participant to summarize the main points they learned in this session.

Trainer Note

This summary should include the main things to "look for" in assessing dehydration and when to refer children to health centers.

If possible, the participants should visit a health center where they can observe children who are being treated for diarrhea and mild dehydration. It is important to emphasize that they need practice assessing dehydration in children, under the supervision of a health worker experienced in this skill, before they can say they can assess dehydration.

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Optional
Step 8
(20 min)

Charts as Teaching Tools for Village Application

As a final application of the material from this session, have participants evaluate the advantages and disadvantages of the WHO Treatment Chart as a teaching tool for community health workers.

The discussion should include some of the following questions:

- Is this chart easy to understand and follow?
- What if any modifications are needed for use in training literate community health workers?
- How can the chart be adapted to make it more appropriate for training non-literate community health workers?

Trainer Note

Session 24 (Adapting and Pretesting Health Education Materials) has information on adapting materials for use with different target groups.

INTRODUCTION TO TREATMENT OF DIARRHEA

WHAT IS DIARRHOEA?

The number of stools normally passed in a day varies with the diet and the person. In diarrhoea, stools contain more water than normal--they are often called loose or watery stools.

Mothers usually know when their children have diarrhoea. When diarrhoea occurs they may say that the stools smell strongly or pass noisily, as well as being loose and watery. By talking to mothers you can often find a useful local definition of diarrhoea. In many societies, diarrhoea is 3 or more loose or watery stools in a day.

Diarrhoea is most common in children, especially those between 6 months and 2 years of age. It is also common in babies under 6 months who are drinking cow's milk or infant feeding formulas.

Frequent passing of normal stools is not diarrhoea.

Babies who are breastfed often have stools that are softer than normal; this is not diarrhoea.

ACUTE AND CHRONIC DIARRHOEA

Acute diarrhoea starts suddenly and may continue for several days. It is caused by infection of the bowel.

Chronic diarrhoea may vary from day to day and lasts for more than 3 weeks. It can be caused by things such as undernutrition, infection, worms or other parasites in the gut.

WHY IS DIARRHOEA DANGEROUS?

The two main dangers of diarrhoea are death and undernutrition.

Death from acute diarrhoea is usually caused by loss of a large amount of water and salt from the body. This loss is called dehydration.

Diarrhoea is worse and more common in persons with undernutrition. Diarrhoea can cause undernutrition and can make it worse because:

(a) nutrients are lost from the body in diarrhoea,

(b) a person with diarrhoea may not be hungry, and

(c) mothers often have a bad habit of not feeding children while they have diarrhoea, or even for some days after the diarrhoea is better.

Food should be given to children with diarrhoea as soon as they will eat.

HOW DOES DIARRHOEA CAUSE DEHYDRATION?

The body normally takes in the water and salts it needs (input) through drinks and food. It normally loses water and salts (output) through stool, urine, and sweat.

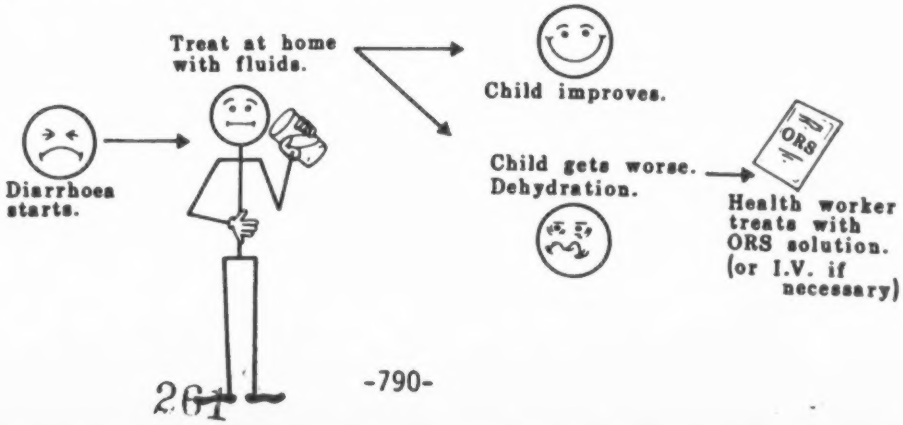
When the bowel is healthy, water and salts pass from the bowel into the blood. When there is diarrhoea, the bowel does not work normally and less water and salts pass into the blood. Thus, more than the normal amount of water and salts are passed in the stool.

This larger than normal loss of water and salts from the body results in dehydration. It occurs when the output of water and salts is greater than the input. The more diarrhoea stools a patient passes, the more water and salts he loses. Dehydration can also be caused by a lot of vomiting, which often accompanies diarrhoea.

Dehydration occurs faster in infants and young children, in hot climates, and when there is fever.

TREATING DIARRHOEA

The most important parts of treatment of diarrhoea are to (1) prevent dehydration from occurring if possible and (2) treat dehydration quickly and well if it does occur.


Treat at home with fluids.
Child improves.
Diarrhoea starts.
ORS
Child gets worse. Dehydration.
Health worker treats with ORS solution. (or I.V. if necessary)

Prevention of Dehydration: Dehydration can usually be prevented in the home by drinking more fluids as soon as the diarrhoea starts. To do this, give locally available fluids, such as rice water, fruit juice, weak tea, or special homemade sugar and salt solutions and/or increase breastfeeding. The types of fluid or solutions used in your area for preventing dehydration in the home will depend on:

- local traditions,
- availability of salt and sugar,
- access of people to health services,
- availability of oral rehydration salts (ORS),
- national policy.

Treatment of Dehydration: If dehydration occurs, the child should be brought to a community health worker or health centre for treatment. The best treatment for dehydration once it has occurred is oral rehydration therapy using a solution made with oral rehydration salts (ORS). This treatment will be described in this module. Although this module talks mostly about treating children with diarrhoea, the same treatment is also good for adults with diarrhoea. For treating dehydration, ORS should always be used if possible.

Throughout this module you will have to consider the recommendations that are made and apply them to the conditions in your own health area.

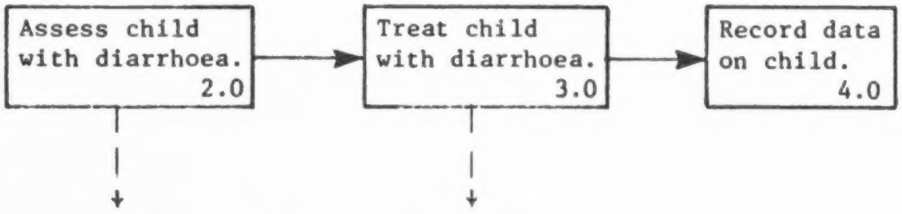
LEARNING OBJECTIVE

The tasks necessary to treat diarrhoea are shown in the following chart. The information, examples, and practice exercises in this module should prepare you to do these tasks in your own health area.

Perform the following step regularly, whenever you have the opportunity:

Educate family members about home treatment of diarrhoea. 1.0

Perform the following steps whenever a child is brought for treatment of diarrhoea:


Assess child with diarrhoea. 2.0
Treat child with diarrhoea. 3.0
Record data on child. 4.0

- *Assess degree of dehydration.*

  Look for signs or symptoms indicating another serious problem.

- *Select treatment plan and treat for dehydration.*

  Treat for any other serious problems.

EDUCATE FAMILY MEMBERS ABOUT HOME TREATMENT OF DIARRHOEA.

Dehydration can often be prevented if certain procedures are followed in the home when a child gets diarrhoea. Teaching family members that diarrhoea can and should be treated at home is very important. They also need to learn how to give the treatment.

Family members may learn from many sources, such as radio broadcasts, schools, posters, community meetings, or visits to a health centre or community health worker. You will need to meet with community leaders and community members to identify several sources which together will reach all the families in the health area. With help and cooperation from community members, each family can learn about treatment of diarrhoea in the home.

Community health workers and workers at health facilities should explain the 3 rules of home treatment to mothers and other family members whenever they have the opportunity (for example, when a mother comes for prenatal visits or brings her child for immunizations).

When explaining how to treat diarrhoea at home, a health worker should also show the mother what to do so she will understand and remember. For example, how much fluid the child should be given, or how to make sugar and salt solution, can be better shown than explained.

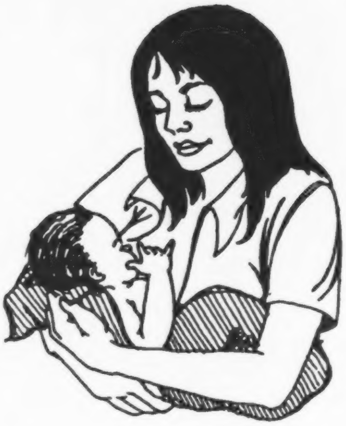
A mother should also be allowed to practice what she learns (for example, mixing the solution) to make sure she can do it.

For those things that are explained but not practiced (for example, actually feeding the child), the health worker should ask the mother to tell in her own words what she has learned, to be sure she remembers.

The 3 rules for treating diarrhoea in the home are discussed on the next 2 pages. They are also shown in a shorter version on "How to Treat Diarrhoea at Home" (the small card for mothers) and in Treatment Plan A on the **DIARRHOEA TREATMENT CHART**, which health workers should keep for reference. Whenever a child gets diarrhoea, the mother (or other family member who is caring for the child) should follow these rules.

3 RULES FOR HOME TREATMENT OF DIARRHOEA

1. Give the child more fluids than usual.



- If the child is breastfed, try to give breast milk more often. If the child is not breastfed, increase the amount of normal milk feed but dilute the feed with an equal volume of water.

- Give the child:

  - locally available drinks or liquids, such as rice water, soups, weak tea, or fruit juices, and/or

  - carefully prepared sugar and salt solutions. These solutions can be made in several ways (see Annex 1).

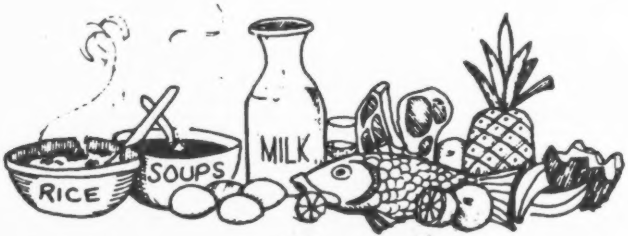
  Children under 2 years old should receive approximately 50-100 ml (1/4 - 1/2 cup) of fluid after each loose stool, and older children should receive twice this amount. Adults should take as much as they want to drink.

2. Continue feeding the child.

Starving a child who has diarrhoea can cause undernutrition or make it worse.

All children 4 months old or older who have been weaned should be offered solid food during diarrhoea. The best foods to give are those which are easily digested (such as boiled rice, porridges, soups, milk products, eggs, fish, and well-cooked meat) and those containing potassium (such as pineapple, bananas, and coconut water). Some fat or oil may also be given.

Even though absorption of nutrients from food is lessened during diarrhoea, most of the nutrients will be absorbed.



A child should be allowed to eat as much as he wants. Food should be offered often (5-7 times a day) during diarrhoea, because the child is not likely to eat much at each time. The child should have at least one extra feed a day for a week after the diarrhoea has stopped.

3. Watch for signs of dehydration.

Discussion of the signs of dehydration begins on page 8 of this module. If a child develops any sign of dehydration, or if his diarrhoea lasts another 2 days, the mother should take the child to the health centre or community health worker.

Home Treatment of Diarrhoea

1. INCREASE fluids
2. CONTINUE food
3. WATCH for signs of dehydration

(From: WHO Supervisory Skills, "Treatment of Diarrhoea")

ASSESSING CHILDREN WITH DIARRHEA

Since the most dangerous effect of diarrhoea is dehydration, the first step in treatment of diarrhoea should be to assess the patient for signs of dehydration. The procedure outlined in this step should be followed when a health worker sees a child whose mother has stated that diarrhoea is the reason, or one of the reasons, for the child's visit. (Health workers should be familiar with all locally used words for diarrhoea or to identify various signs of diarrhoea.) These same procedures should be followed again when the health worker reassesses the patient after some treatment has been administered.

NOTE: Mothers will probably expect you to give a treatment that will stop the child's diarrhoea. It may be necessary to explain that oral rehydration treatment is meant to stop or prevent dehydration, and explain why this is more important than stopping the diarrhoea.

ASK, LOOK, AND FEEL FOR SIGNS OF DIARRHOEA OR OTHER SERIOUS PROBLEMS.

The signs a health worker should ask, look, and feel for are listed below and on the next page, and in the table "How to Assess Your Patient" on page 13. Fold out this table now. Read the following list to become familiar with the questions a health worker should ask, the conditions he should feel for, and the things he should look for. As you are reading this material, also refer to the fold-out table to learn how to interpret each sign.

The health worker should:

ASK the following questions:

- How many liquid stools per day has the child had?
  For how long has the child had diarrhoea? Is there blood (more than 1 or 2 streaks) and mucus in the stool?
- Has there been any vomiting?
  If so,
  - Has there been more than a small amount?
  - How frequently has the child vomited?
- Is the child able to drink?
  If so, is he thirstier than normal?
- Has the child passed urine in the last 6 hours?
  If so,
  - Is it a normal amount or a small amount?
  - Is it darker than normal?

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LOOK for the following conditions:

- What is the child's general condition?
  - Is he well and alert?
  - Is he unwell, sleepy, or irritable?
  - Is he very sleepy, floppy, or unconscious?
  - Is he having fits?
  - Is he severely undernourished? Note: A health worker may be able to tell by observation whether a child has severe undernutrition. If he cannot tell by observation, he can determine whether a child between 1 and 5 years old is undernourished by measuring the upper arm. If the distance around the arm is less than 12.5 cm, the child is severely undernourished. One way to measure the arm is with a tri-coloured arm strip (see Annex 2). If the red part of the strip is touched, the child is severely undernourished.

- Does the child have tears when he cries?
- Are his eyes normal, sunken, or very dry and sunken?
- Is his mouth wet, dry, or very dry?
- Is his breathing normal, faster than normal, or very fast and deep?

FEEL for the following:

- When the skin is pinched, does it go back quickly, slowly, or very slowly (longer than 2 seconds)? In a baby, the health worker should pinch the belly; he may also pinch the back of the neck, or back of the hand. Note: Pinching the skin may give misleading information in severely undernourished or obese patients. In the severely undernourished patient, the skin may go back slowly even if the patient is not dehydrated. In the obese patient, the skin may go back quickly even if the patient is dehydrated.

- Can the pulse be felt?
  If so, is it normal, faster than normal, very fast, or weak?

- Is the fontanelle (the soft spot on top of the head) normal, sunken, or very sunken?
  Note: This is a helpful sign only in children whose fontanelle is not yet closed (usually children under 12 months old).

WEIGH the child, if a weighing machine is available.

The reasons for weighing the child are: (1) If the child has been weighed routinely, you can notice sudden weight losses during a diarrhoeal illness which can indicate the presence and extent of dehydration, and (2) weighing the child at intervals during therapy is helpful in assessing the progress of rehydration.

- If a weighing machine is available, carefully weigh the child unclothed or lightly clothed. If the child has been routinely weighed and his weight has been recorded, compare the child's present weight with his last recorded weight.

  Has there been any weight loss during the diarrhoea? If so, has there been a weight loss of 25-100 grams for each kilogram of the child's weight or has the weight loss been more than 100 grams for each kilogram of weight?

  This may be difficult to determine without a very accurate weighing machine. For this reason, it is best to rely on your assessment of the other signs to make a judgement about dehydration.

- If a weighing machine is not available, do not delay treatment.

TAKE TEMPERATURE:

- Does the child have a high fever (more than 38.5°C or 101°F)? Note: Take the child's temperature either in the rectum or the armpit. Rectal temperature should be taken if the health worker is used to that procedure and has several rectal thermometers or is able to disinfect the thermometer after each use. Otherwise, the axillary (armpit) temperature should be taken.

DETERMINE APPROPRIATE TREATMENT.

- Locate on the table "How to Assess Your Patient" the signs which describe the child's condition.

- Determine if any of the signs in Column D are present. If so, there are serious problems which require treatment in addition to any treatment which may be needed for dehydration. Treat these problems according to customary practice or refer for treatment. If there is much blood and mucus in the stool and high fever, suspect dysentery. Treat this problem with antimicrobials.

- Determine the degree of dehydration.

  - Look at Column C. If 2 or more of the signs listed in that column are present, conclude that the patient has severe dehydration.

  - If 2 or more signs from Column C are not present, look at Column B. If 2 or more of the signs listed in that column are present, conclude that the patient has some dehydration.

  - If 2 or more signs from Column B are not present, conclude that the patient has no signs of dehydration.

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- Select the appropriate treatment plan based on the degree of dehydration. These treatment plans are described on the **DIARRHOEA TREATMENT CHART**, which you will be given.

  For no signs of dehydration, select Treatment Plan A - To Prevent Dehydration.

  For some dehydration, select Treatment Plan B - To Treat Dehydration with ORS Solution.

  For severe dehydration, select Treatment Plan C - To Treat Severe Dehydration Quickly.

EXAMPLE A mother brought her 3-year-old daughter, Rania, into a clinic because she had diarrhoea. The clinic worker asked, looked and felt for signs of dehydration. Here is the table "How to Assess Your Patient" with his findings circled:

HOW TO ASSESS YOUR PATIENT

		A	B	C	D
1. ASK ABOUT:	DIARRHOEA	[✓ Less than 4 liquid stools per day]	4 to 10 liquid stools per day	More than 10 liquid stools per day	Longer than 3 weeks duration (chronic diarrhoea) [✓ Blood or mucus in the stool]
	VOMITING	[✓ None or a small amount]	Some	Very frequent	
	THIRST	[✓ Normal]	Greater than normal	Unable to drink	
	URINE	[✓ Normal]	A small amount, dark	No urine for 6 hours	
2. LOOK AT:	CONDITION	Well, alert	[✓ Unwell, sleepy or irritable]	Very sleepy, unconscious floppy or having fits	Severe undernutrition
	TEARS	[✓ Present]	Absent	Absent	
	EYES	[✓ Normal]	Sunken	Very dry and sunken	
	MOUTH and TONGUE	[✓ Wet]	Dry	Very dry	
	BREATHING	[✓ Normal]	Faster than normal	Very fast and deep	
3. FEEL:	SKIN	[✓ A pinch goes back quickly]	A pinch goes back slowly	A pinch goes back very slowly	
	PULSE	[✓ Normal]	Faster than normal	Very fast, weak, or you cannot feel it	
	FONTANELLE (in infants)	Normal	Sunken	Very sunken	
4. TAKE TEMPERATURE					[✓ High fever - 38.5°C (or 101°F) or greater]
5. WEIGH IF POSSIBLE		No weight loss during diarrhoea	Loss of 25-100 grams for each kilogram of weight	Loss of more than 100 grams for each kilogram of weight	
6. DECIDE		The patient has no signs of dehydration Use Plan A	If the patient has 2 or more of these signs, he has some dehydration Use Plan B	If the patient has 2 or more of these danger signs, he has severe dehydration Use Plan C	If the patient has chronic diarrhoea, undernutrition, or high fever, treat or refer to ____________ for treatment. If there is blood or mucus in the stool and high fever, suspect dysentery and treat with antimicrobials.

Because Rania had blood and mucus in her stool and a high fever (Column D), the clinic worker suspected dysentery and prescribed Ampicillin. Since Rania had no signs from Column C and only 1 sign from Column B, the clinic worker determined that she had no signs of dehydration. He thus used Treatment Plan A to prevent Rania from becoming dehydrated.

(From: WHO Supervisory Skills, "Treatment of Diarrhoea")

WHO DIARRHEA TREATMENT CHART

HOW TO ASSESS YOUR PATIENT

		A	B	C	D
1. ASK ABOUT:	DIARRHOEA	Less than 4 liquid stools per day	4 to 10 liquid stools per day	More than 10 liquid stools per day	Longer than 3 weeks duration (chronic diarrhoea)
	VOMITING	None or a small amount	Some	Very frequent	Blood or mucus in the stool
	THIRST	Normal	Greater than normal	Unable to drink	
	URINE	Normal	A small amount, dark	No urine for 6 hours	
2. LOOK AT:	CONDITION	Well, alert	Unwell, sleepy or irritable	Very sleepy, unconscious, floppy or having fits	Severe undernutrition
	TEARS	Present	Absent	Absent	
	EYES	Normal	Sunken	Very dry and sunken	
	MOUTH and TONGUE	Wet	Dry	Very dry	
	BREATHING	Normal (20-30)	Faster than normal (30-40)	Very fast and deep (40-60)	
3. FEEL:	SKIN	A pinch goes back quickly	A pinch goes back slowly	A pinch goes back very slowly	
	PULSE	Normal (less than 120)	Faster than normal (120-140)	Very fast, weak, or you cannot feel it (over 140)	
	FONTANELLE (in infants)	Normal	Sunken	Very sunken	
4. TAKE TEMPERATURE					High fever - 38.5°C (or 101°F) or greater
5. WEIGH IF POSSIBLE		No weight loss during diarrhoea	Loss of 25-100 grams for each kilogram of weight	Loss of more than 100 grams for each kilogram of weight	
6. DECIDE		The patient has no signs of dehydration Use Plan A	If the patient has 2 or more of these signs, he has some dehydration Use Plan B	If the patient has 2 or more of these danger signs, he has severe dehydration Use Plan C	If the patient has chronic diarrhoea, severe undernutrition, or high fever, treat or refer to ____ for treatment. If there is blood or mucus in the stool and high fever, suspect dysentery and treat with antimicrobials.

TREATMENT PLAN A

TO PREVENT DEHYDRATION

EXPLAIN TO THE MOTHER HOW TO TREAT DIARRHOEA AT HOME FOLLOWING THREE RULES:

1. GIVE YOUR CHILD MORE FLUIDS THAN USUAL, such as:
   - rice water, fruit juice, weak tea, or salt and sugar solution and
   - breast milk, or milk feeds mixed with equal amounts of water
2. GIVE YOUR CHILD FOOD:
   - as much as he wants
   - 5 to 7 times a day
   - which is easy to digest
   - which contains potassium
3. WATCH FOR SIGNS OF DEHYDRATION. (You must show the mother how to ASK, LOOK AND FEEL for the signs. Then ask her to show you.)
   BRING YOUR CHILD BACK, IF:
   - you see any signs
   - your child has diarrhoea for another two days

TELL THE MOTHER THESE RULES ARE IMPORTANT. EXPLAIN THAT SHE CAN PREVENT DIARRHOEA, IF:

- she gives her child fresh, clean and well-cooked food and clean drinking water
- she practices good hygiene

SHOW THE MOTHER HOW TO PREPARE AND GIVE ORS SOLUTION AT HOME, IF:

- her child has been on Plan B
- it is national policy to give ORS solution to all children who visit a health centre for diarrhoea treatment
- the mother cannot come back if the diarrhoea gets worse

GIVE THE MOTHER ENOUGH ORS PACKETS FOR 2 DAYS

AFTER EACH LOOSE STOOL, TELL HER TO GIVE:

- 50-100 ml (¼-½ cup) of ORS solution for a child less than 2 years old
- 100-200 ml for older children. Adults can take as much as they want

If the child vomits, tell her to wait 10 minutes and then continue slowly giving small amounts.

NOTE: Children being given ORS solution should not also receive salt and sugar solution.

TREATMENT PLAN B

TO TREAT DEHYDRATION WITH ORS SOLUTION

1. USE THIS TABLE TO SEE HOW MUCH ORS SOLUTION IS SUITABLE FOR 4-6 HOURS TREATMENT:

<table>
<tr><td colspan="2">Patient's weight in kilograms</td><td colspan="6">3 5 7 9 11 13 15 20 30 40 50</td></tr>
<tr><td colspan="2">Patient's age *</td><td colspan="6">2 4 6 8 10 12 18 2 3 4 6 8 15 adult
← months → ← years →</td></tr>
<tr><td rowspan="2">Give this much solution for 4-6 hours</td><td>in ml:</td><td>200-400</td><td>400-600</td><td>600-800</td><td>800-1000</td><td>1000-2000</td><td>2000-4000</td></tr>
<tr><td>in local unit of measure:</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

* Use the patient's age only when you do not know the weight.

If the patient wants more ORS solution, give more. If the eyelids become puffy, stop and give other fluids. Use ORS solution again when the puffiness is gone.

If the child vomits, wait 10 minutes and then continue slowly giving small amounts of ORS solution.

2. IF THE MOTHER CAN REMAIN AT THE HEALTH CENTRE

- tell her how much ORS solution to give her child
- show her how to give it
- watch her give it

3. AFTER 4-6 HOURS REASSESS THE CHILD. THEN CHOOSE THE SUITABLE TREATMENT PLAN.

NOTE: FOR CHILDREN UNDER 12 MONTHS CONTINUING TREATMENT PLAN B AFTER 4-6 HOURS, TELL THE MOTHER TO GIVE:

- breast milk feeds between drinks of the ORS solution, or
- 100-200 mls of clean water before continuing ORS if she does not breast feed her child

4. IF THE MOTHER MUST LEAVE ANY TIME BEFORE COMPLETING TREATMENT PLAN B, TELL HER:

- to finish the 4-6 hour treatment as in 1. above
- to give the child as much ORS solution as he wants after the treatment
- to look for the signs of dehydration and, if the child has any, to return the next morning

Give her enough ORS packets for 2 days and show her how to prepare ORS solution.

Explain briefly how to prevent diarrhoea.

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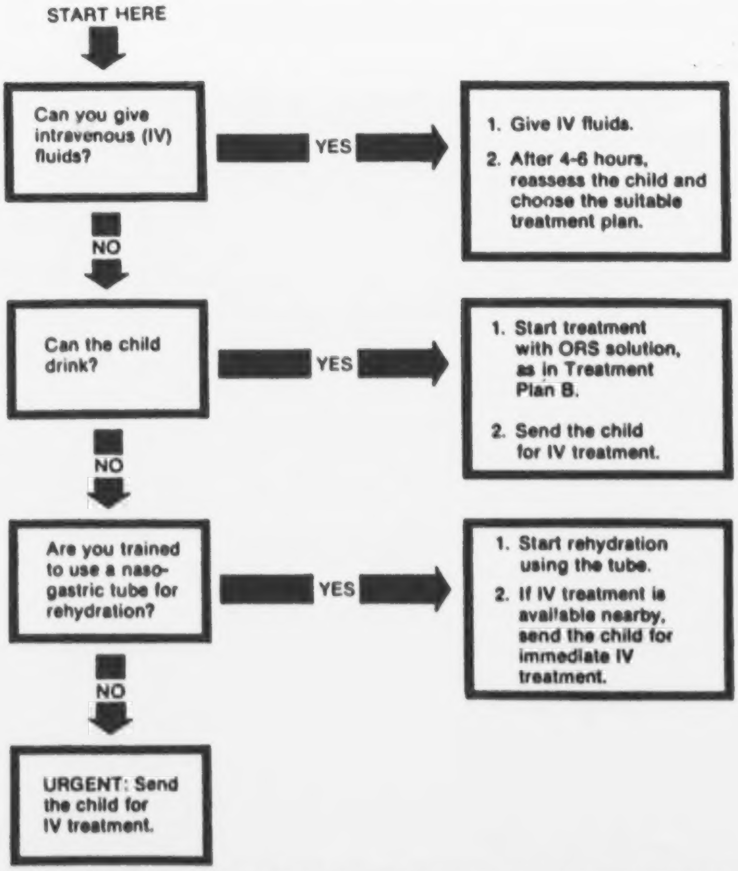
TREATMENT PLAN C

TO TREAT SEVERE DEHYDRATION QUICKLY

Follow the arrows. If the answer to the questions is 'yes', go across. If it is 'no', go down.



Can you give intravenous (IV) fluids?

1. Give IV fluids.
2. After 4-6 hours, reassess the child and choose the suitable treatment plan.

Can the child drink?

1. Start treatment with ORS solution, as in Treatment Plan B.
2. Send the child for IV treatment.

Are you trained to use a naso-gastric tube for rehydration?

1. Start rehydration using the tube.
2. If IV treatment is available nearby, send the child for immediate IV treatment.

URGENT: Send the child for IV treatment.

NOTE: If there is a high fever, show the mother how to cool the child with a wet cloth and fanning.

(From: WHO Supervisory Skills, "Treatment of Diarrhoea")

DIARRHEA AND DEHYDRATION CASE ASSESSMENTS

In this exercise you will read descriptions of 3 different children with diarrhoea. For each child, you will assess the degree of dehydration, select a treatment plan, and describe the treatment you would give.

Refer to the **DIARRHOEA TREATMENT CHART** as you work. You should become familiar with the chart so that you will be comfortable referring to it when you treat patients who come to you.

CASE 1

Sione is 5 months old. His mother is breastfeeding him. His diarrhoea started last night and he has had 8 stools which were very watery. He also vomited. The health worker looks for blood and mucus in the stool but cannot see any.

As the health worker examines Sione, she finds that the skin pinch goes back slowly, the fontanelle is a little sunken, and the eyes are a little sunken. Sione does not have a fever and is not vomiting now. His urine amount is normal.

a. Does the child have signs of dehydration? If yes, describe them.

b. Is he severely dehydrated?

c. Which treatment plan should the health worker select and follow?

d. How much ORS solution should be given to the child in the first 4 - 6 hours?

e. What should be done if the child vomits?

f. When should the child be reassessed?

When the health worker reassesses Sione, she finds that he is still having some diarrhoea. His skin pinch goes back quicker than before, but his eyes and fontanelle are still a little sunken.

g. Describe the treatment to be given now.

After another 4 hours, Sione looks much better. His eyes have filled out, the fontanelle is normal, and the skin pinch goes back quickly.

h. What should be done next? Why?

CASE 2

Ana is 3 years old and weighs 13 kg. Her diarrhoea started 24 hours ago and she has had 3 liquid stools. Her mother took her to the home of the community health worker. As the health worker assesses the child, he finds that she looks quite well. Her mouth is wet, her skin when pinched goes back quickly, her eyes look normal, her pulse is normal, and she passes urine normally. However, her mother says she wants to drink a lot.

a. Identify the sign(s) of dehydration which Ana has.

b. What treatment plan should the health worker select and follow?

c. It is the policy of the national diarrhoeal disease control programme to give ORS solution to children who visit a health worker for treatment of diarrhoea. The health worker gives Ana's mother enough ORS packets for 2 days and shows her how to mix and give ORS solution. Ana's mother gives Ana about 200 mls of ORS now. When should the mother give Ana ORS solution again, and how much should she give to her?

d. What advice should the mother be given about feeding the child? (List the liquids and foods available in your area.)

e. What should the mother do in the future when the child gets another episode of diarrhoea?

CASE 3

Dano is 8 months old. He is already weaned. His mother brings him to a community health worker because he has had diarrhoea for a week and it is now worse. (There have been more than 10 liquid stools the day she brings him to the health worker). Dano has received no food since the diarrhoea started. He is very quiet and floppy. He has passed no urine since last night. When he cries there are no tears. The health worker takes the child's temperature and finds that it is 40°C. Dano has very dry and sunken eyes and a very sunken fontanelle, and a very fast pulse. However, he is conscious and opens his eyes to look at the health worker.

a. What signs of dehydration does Dano have?

b. Is there some dehydration or severe dehydration?

c. Are there any other serious problems?

The community health worker is not able to provide IV treatment, so he decides to send Dano with his mother to the health centre.

d. What should he do for Dano before the child is sent to the health centre (Dano is able to drink)?

Dano and his mother arrive at the health centre where IV treatment can be administered. This health centre uses Ringer's Lactate solution. The nurse weighs Dano and finds he weighs 5 kilos.

e. How much IV fluid should be given to the child the first hour?

Two hundred ml of IV fluid are given to the child within the next 2 hours. His fever is treated according to the customary procedure of the health centre. The child's progress is assessed. The number of stools is decreasing and he has urinated. His eyes and fontanelle are still sunken, his pulse is not as fast, and he is a little more alert.

f. What should the child be given during the next 3 hours? How much should be given?

After 6 hours of therapy, Dano's fontanelle is a little sunken. His eyes are sunken but not dry, and his pulse is normal. He no longer has a high fever.

g. What treatment plan should be selected and followed?

(From: WHO Supervisory Skills, "Treatment of Diarrhoea")

GUIDELINES FOR THE PRESENTATION OF THE WHO DIARRHEA TREATMENT CHART

A. Explain the purpose of the Chart.

1) To show how to assess patients for signs of diarrhea and dehydration.

2) To serve as a reference for medical personnel.

B. Identify and demonstrate the signs and symptoms of diarrhea and dehydration, including chronic diarrhea and acute dysentery.

1) Examples of what to include and ways to do it are found on the attached pages and in Handouts 39 A-C. Country or culturally specific pictures of the signs should be used.

2) Have participants practice taking a pulse and timing respiration rates. Ask them to take their temperature under the axillary arm and in the mouth and compare their readings. (There is usually 1° difference).

3) Explain that all children who show signs listed under Column D, of the WHO chart, alone or in conjunction with signs from Column A, B, or C need to visit a health center for treatment with specific drugs as well as with oral rehydration solution.

C. Close the step by mentioning the five steps a person should do in his or her continued assessment of the child's condition.

1) Ask the mother about the child's condition.

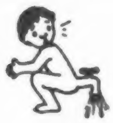
2) Look for signs indicating the child's condition.

3) Feel the child for skin elasticity, pulse rate and sunken fontenelle.

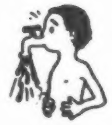
4) Weigh the child.

5) Take the child's temperature.

What is dehydration?



It is the loss of too much water!

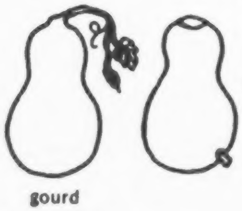


To look at the problem of dehydration, **start by talking about something familiar to the children.**

For example, in Latin America and parts of Africa, people associate diarrhea with sinking in of the soft spot (fontanel) on the top of a baby's head. People believe the brains have slipped down and this has caused the baby's diarrhea. Help the children see for themselves that the sinking of the soft spot results from the loss of water in the baby's body (dehydration).

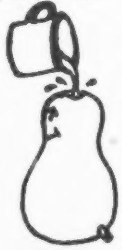
To learn about dehydration, the children can conduct their own experiment by making a 'gourd baby' like this one:

1. Cut off the top, like this.

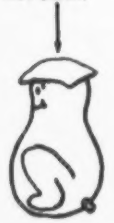


2. Fill the gourd to the brim with water.

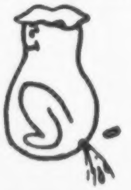
Make a small hole with a plug.



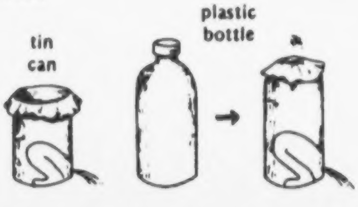
3. And cover it with a thin wet cloth.



4. Then have the children pull the plug and watch the cloth (soft spot) sink in!

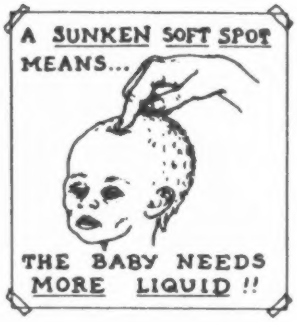


If you do not have gourds, a plastic bottle or tin can will do.


tin can
plastic bottle

Ask the children: "Why did the cloth sink in? What does the baby need to make the soft spot rise again?" In this way **the children find out for themselves that a sunken soft spot in a baby is a sign of dehydration.**

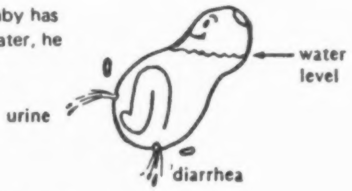
The children may want to make drawings or posters like this one so that other persons can learn, too.


A SUNKEN SOFT SPOT MEANS...
THE BABY NEEDS MORE LIQUID !!

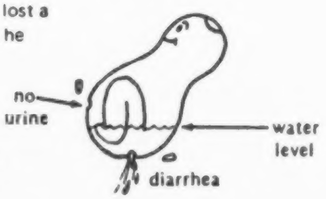
Learning the different signs of dehydration

The children have already discovered that a sunken soft spot is a sign of dehydration. By putting additional holes in the 'gourd baby', they can experiment to learn other signs of dehydration.

When a baby has enough water, he pees well.


water level
urine
diarrhea

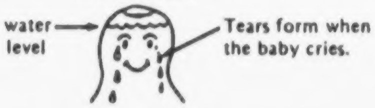
When he has lost a lot of liquid, he no longer passes urine (although the diarrhea continues).


no urine
water level
diarrhea

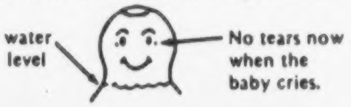
In this way, the children discover that **a child who passes little or no urine is probably dehydrated.**

By putting a small hole at the corner of each eye, the children can notice that tears no longer form when a baby is dehydrated.

When the gourd is full of water, it forms tears.


water level
Tears form when the baby cries.

When water is lost, tears no longer form.


water level
No tears now when the baby cries.

So the children learn that **if a baby does not form tears when he cries, he is probably dehydrated.**

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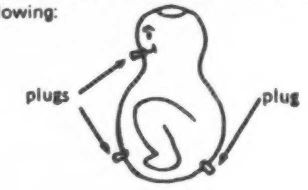
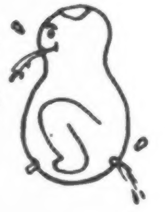
To find out what happens when a child has vomiting as well as diarrhea, the children can do the following:



Pull out the plugs to show that diarrhea with vomiting causes a more rapid loss of water.

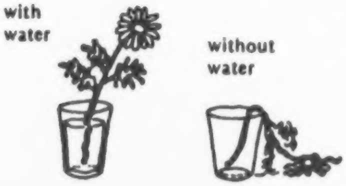


In this way, the children find that **dehydration comes more quickly and is more dangerous when a child with diarrhea also has vomiting.**

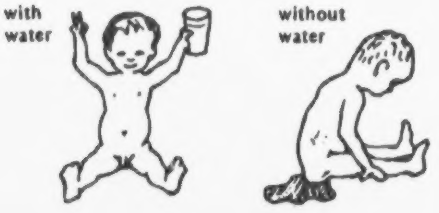
What happens when a child loses too much water?

The children can experiment to see how dangerous dehydration is to a baby.

For example: They can pick 2 flowers, put one in water, and keep the other without water. They will see that one lives while the other wilts and dies. Ask them why this happens.

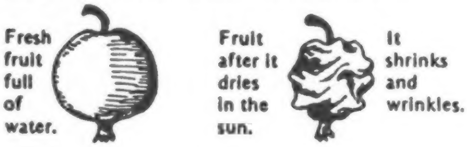

with water
without water

Let the children compare this to a child with diarrhea.


with water
without water

Ask the children, "What does a baby with diarrhea need so it will not wilt and die?"

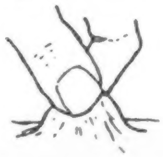
Or the children can put a fruit like a plum or guava in the hot sun to see what happens to it.


Fresh fruit full of water.
Fruit after it dries in the sun.
It shrinks and wrinkles.

Ask the children what they think happens to a baby when he dries out. Right! He loses weight and can even become wrinkled.

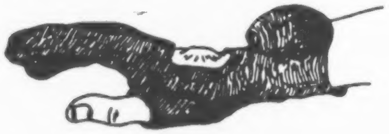
Often you will not see the wrinkles of a dehydrated child at once. But children can learn to do the following 'belly wrinkle test':

Lift the skin of the belly between two fingers, like this.

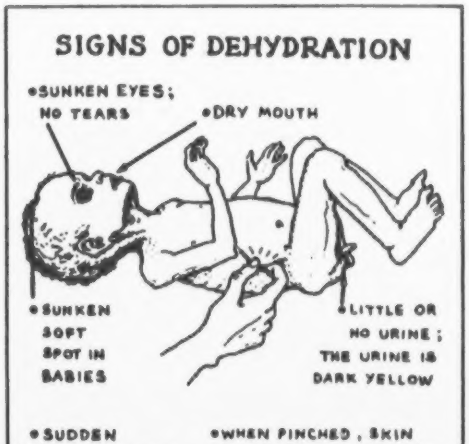


Then let go. If the skin does not spring right back to normal, the child is dehydrated.

Children can practice this test by pinching the skin on the back of an adult's hand. To make it seem more real, the children can make a simple doll baby like this from an old sock.



After the children find out the different signs of dehydration from their experiments, they can write the list of signs on the blackboard or on a poster.


SIGNS OF DEHYDRATION
•SUNKEN EYES; NO TEARS
•DRY MOUTH
•SUNKEN SOFT SPOT IN BABIES
•LITTLE OR NO URINE; THE URINE IS DARK YELLOW
•SUDDEN WEIGHT LOSS
•WHEN PINCHED, SKIN DOES NOT SPRING BACK

(From: Helping Health Workers Learn. Chapter 24, pp. 18-19)

CASE STUDIES FOR THE TREATMENT OF DIARRHEA

TREATMENT PLAN A

The three treatment plans are found on the **DIARRHOEA TREATMENT CHART**. Look at that chart now and read "Treatment Plan A," which describes treatment that should be given when your assessment has shown no signs of dehydration. Then do the following exercise.

A mother has brought her 11-month-old child to a Community Health Worker because the child has diarrhoea. The mother is breastfeeding the child. She says she lives far from the health worker and might not be able to come back for several days, even if the child gets worse. The health worker asks, looks and feels for signs of dehydration and finds that the child has none. He decides to begin treatment using Treatment Plan A. The mother mentions that usually she gives her children rice water when they get diarrhoea but heard that the Community Health Worker has something better.

Describe what the health worker would do and what he would tell the mother.

Answer:

Your answer should cover these points in your own words. It may be less detailed than this.

The health worker would first compliment the mother for bringing her child before he got very sick.

He would tell the mother to increase the amount of fluids offered to the child. This would include increasing the amount of breast milk and giving other locally available fluids, such as rice water. He would explain that giving rice water, weak tea, or juice is a good practice when children get diarrhoea.

He would explain that the mother should feed the child often (5-7 times a day) with foods that are easily digested and which contain potassium (and would give examples of these foods that the mother would know).

He would explain to the mother how to watch for and recognize signs of dehydration and make sure she understands. Note: Some health workers tell mothers only the more obvious signs of dehydration (so they will not have so much to remember). These are:

- greater than normal thirst,
- dark urine,
- unwell, sleepy or irritable condition,
- sunken eyes,
- sunken soft spot on the top of the head,
- a pinch of skin goes back slowly.

He would tell the mother to come quickly to the health centre or to a community health worker if signs of dehydration appear or if the diarrhoea lasts another 2 days.

He would explain to the mother how diarrhoea can be prevented by giving the child fresh, clean and well-cooked food and clean drinking water, and by practicing good hygiene.

Because the mother lives far away, the health worker would then give her enough ORS to last 2 days. He would show her how to prepare ORS solution and make sure she understood. He would tell her to give the child 50-100 ml of ORS solution after each loose stool, show her how much that is, and have her begin giving ORS solution to the child. He would also tell her what to do if the child vomits.

TREATMENT PLAN B

Now read "Treatment Plan B," describing treatment when some dehydration is present, on the **DIARRHOEA TREATMENT CHART**. Then do the following exercise. Remember that it is important to give ORS solution in small amounts, as with a spoon, and at a steady pace.

SHORT-ANSWER EXERCISE

1. A child with diarrhoea has some signs of dehydration. The child weighs 5 kg and is 8 months old. How much ORS solution should be given to him during the first 4-6 hours?

2. A mother has brought her 2-1/2-year-old daughter to the health facility. The child was assessed and found to have some signs of dehydration. While at the facility, the mother gave her 700 ml of ORS solution within 4 hours. After 4 hours, the child was reassessed and it was determined that she still had some of the signs of dehydration but she was improving. Assuming that the mother can stay at the facility, what should be done next?

3. A one-year-old baby with diarrhoea was brought to the health centre by his grandmother. The baby was assessed and found to have some signs of dehydration. The grandmother must leave soon because her bus will be leaving and her home is too far away for her to walk. What should the health worker do?

Answer:

1. 200 to 400 ml of ORS solution should be given in a period of 4 hours. (When both the weight and the age of the child are known, determine the amount of solution needed according to the child's weight.)

2. Give the child an additional 600 to 800 ml of ORS solution during the next 4 - 6 hours.

3. Mix some ORS solution, showing the grandmother how it is done. Show the grandmother how to feed the baby the solution, slowly with a spoon, and ask her to begin now. Tell the grandmother:

    - to continue for 4 - 6 hours until 600 mls has been given.
    - after that, to give as much solution to the baby as he wants.
    - if the baby's eyelids become puffy, stop giving ORS solution and give other fluids instead until the eyelids return to normal. Then resume ORS solution.

    Two packets of ORS should be given to the grandmother. The signs of dehydration should be pointed out and explained to the grandmother. The grandmother should then repeat them and show how she will look for them in the morning. If any of the signs of dehydration are still present in the morning, the grandmother should bring the baby back to the health centre.

TREATMENT PLAN C

Read "Treatment Plan C," describing treatment for severe dehydration, on the **DIARRHOEA TREATMENT CHART**. Also read Annex 5, "Oral Rehydration Using a Nasogastric Tube," and Annex 6, "Intravenous Therapy for Severe Dehydration." Then do the following exercise:

SHORT-ANSWER EXERCISE

1. A 9 kg. child who is very drowsy and cannot drink is brought to a small health centre. There is no IV equipment at the health centre but the health worker knows how to use a nasogastric tube. How much ORS solution should be given through the nasogastric tube in the first hour?

2. A 4-month-old baby weighing 5 kg. has received 350 mls of IV fluid in 3 hours and is improving. She can now drink. Complete the following sentence to show the correct treatment.

   Give ______ mls of ____________ within the next ____hour(s).

3. A 3-month-old boy weighing 4 kg. has been treated for severe dehydration for 6 hours, first with IV for 3 hours and then with ORS solution for 3 hours. The child has just been reassessed. He is improving but still has some signs of dehydration. Complete the following sentence to show the correct treatment.

   Give _____ mls of ____________within the next ____ hour(s).

Answer:

1. 180 ml (20 x 9 = 180)
   (The child weighs 9 kg, and Annex 5 specifies 20 ml/kg.)

2. Give 200 ml (40 ml x 5 kg) of ORS solution within the next 3 hours.

3. Give 200 to 400 ml of ORS solution within the next 4 - 6 hours (Amount of ORS solution is based on the table in Treatment Plan B on the **DIARRHOEA TREATMENT CHART**.

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TREATMENT OF OTHER SERIOUS PROBLEMS

Refer to the **DIARRHOEA TREATMENT CHART** and Annex 7 of this module as needed as you do the following exercise:

SHORT-ANSWER EXERCISE

A child is brought to you for treatment of diarrhoea. The child is 1 year old and weighs 10 kg. You assess the child and find that he has some dehydration. You also find that he has a fever of 40.5°C and blood and mucus in the stool.

In addition to ORS treatment for his dehydration, what other treatment should you give the child?

Answer:

You should begin antimicrobial treatment for possible dysentery. According to Annex 7, the drug of choice would be either Ampicillin or Trimethoprin-Sulfamethoxazole. If you chose Ampicillin, the dose would be 1000 mg a day (100 mg x 10 kg) in 4 doses. That would be 250 mg given 4 times a day. The treatment would be continued for 5 days.

You should also try to lower the fever (for example, with a wet cloth and fanning).

(From: WHO Supervisory Skills, "Treatment of Diarrhoea".)

Session 40

REHYDRATION THERAPY

TOTAL TIME 3 hours

OVERVIEW

To effectively treat dehydration requires the replenishment of salts, fluids, and nutrients to the body. All types of diarrhea require some type of rehydration and different methods have been used over time to accomplish this goal. In Session 39 participants learned the signs and symptoms of diarrhea and dehydration that indicate the use of Treatment Plans A (sugar and salt) to prevent dehydration, B (ORS) to treat mild dehydration, and C (IV or nasogastric tube) for treatment of severe dehydration and rapid rehydration needs. In this session they develop a further understanding of the biological need for rehydration and the reasons for the effectiveness of ORS. Through hands-on experience of solution preparation participants explore differences in the ORT solutions and clarify the usage of each treatment method.

OBJECTIVES

- To explain why oral rehydration is necessary for the prevention and/or treatment of dehydration.
  (Step 1)
- To explain the components of two kinds of oral rehydration therapies and the appropriate use of each solution.
  (Step 2, 4, 5)
- To accurately mix two kinds of oral rehydration solutions.
  (Step 4)

RESOURCES

"Oral Rehydration Therapy for Childhood Diarrhea", Population Reports.

Handout:
- 40A ORT Preparation Worksheet

Trainer Attachments:
- 40A Materials and Equipment Needed for Two Oral Rehydration Therapy Stations
- 40B Explanation and Overview of Types of Rehydration Solutions
- 40C Using Models to Demonstrate Diarrheal Dehydration
- 40D Five Steps of Diarrhea and Its Management

MATERIALS Read Trainer Attachments 40A and 40C for a list of materials and equipment needed for practice stations and for presenting the information in Step 1. Newsprint, markers.

Trainer Note

In strict adherence to WHO guidelines, Peace Corps advocates the use of only two types of ORS solutions--prepackaged and sugar-salt solutions--in Peace Corps projects and in this training program. As discussed in Session 4 of the ORT Manual, and reviewed in this session, WHO Treatment Plans A and B outline the appropriate and effective use of these two solutions in ORT. Before this session, find out what recipes for oral rehydration solutions the government and other agencies are using. In some areas more than one agency may be encouraging the use of ORT with different recipes. Be prepared to discuss these differences and their potential for confusing the public.

Please note that research is currently being conducted on "rice powder" ORS. Rice-powder ORS substitutes rice powder (ie., ground rice) for glucose, an essential component of the standard OR formula. (Rice-powder ORS should not be confused with rice water, Rice water is the fluid drained from the rice after cooking. Since it generally contains very little salt and variable amounts of rice starch, rice water is considered unsuitable for active rehydration. It is not an oral rehydration solution.) Possible advantages and disadvantages of rice-powder ORS are being studied but no conclusion can be drawn until further research is done.

Trainers should only emphasize rice powder ORS in countries where a definite policy and guidelines on this subject have been developed and operationalized by the MOH. Only in countries where definite policies exist should rice powder ORS be incorporated as an ORT approach. In such cases, the trainer has the responsibility of becoming familiar with exact MOH guidelines and explaining those to the participants through discussion and a handout.

Continued

The main purpose of this session is to provide the participants with hands-on practice in correctly preparing the prepackaged and sugar-salt solutions. To ensure that all participants gain practice in mixing and tasting each solution you should, in advance of this session:

- Prepare two work stations with the materials and equipment stated in Trainer Attachment 40A.
- Write and post at each station concise and informative work descriptions (see Trainer Attachment 40B).
- Identify individuals in the group or training center who have had experience using and preparing these therapies to act as resource persons during Step 4.
- Pre-weigh and measure all locally available utensils and ingredients that will or can be used in preparing the solutions. If one liter containers are not commonly available, you must adjust the formula in Trainer Attachment 40B, accordingly. It is important that the Trainees be as exact as possible when preparing the solutions. Please stress this point.

Step 1
(20 min)

Rationale for the Use of Oral Rehydration Therapy

Begin this step by stating that in order to understand why oral rehydration therapy is critical in the prevention and treatment of diarrhea, it is important to understand the scientific rationale for its use (see Trainer Note on page 820).

Using a plastic bag or clay pot, as explained in Trainer Attachment 40C (Using Models to Demonstrate Diarrhea and Dehydration), explain and demonstrate the effects of diarrhea and dehydration and the five steps of diarrhea and its management (Trainer Attachment 40D).

Trainer Note

Include in your rationale the following points:

- When the intestine is healthy, it is able to take food, break it down into the basic molecules that are usable by the body's cells and transport these molecules back across the one-celled thick lining that separates the inside of the intestine from the outside.

- The ultimate source of the liquid that the intestine uses to digest (break down) the food into molecules that are usable by the body's cells is the blood stream.

- From the blood stream the intestine abstracts the water, sodium and potassium (electrolytes) it needs to digest and transport the food molecules back into the body and passes the rest of this fluid out in the stool.

- When a person's intestine is infected by some microbe or toxin, this back and forth flow works less effectively and excessive amounts of water and electrolytes (sodium, potassium, chloride and bicarbonate) are passed out in the stool.

- Fluid loss of greater than five percent, but less than ten percent of body weight generally causes a weak rapid pulse, loss of skin elasticity, low blood pressure, severe thirst, and other signs noted in Column B of the WHO Diarrhea Treatment Chart.

- Oral rehydration works to replace the blood with electrolytes nearly as quickly as they are lost in the stool. This is due in large measure to the special ability of glucose to increase the absorption rate of sodium through the intestinal lining.

Summarize by stating that Oral Rehydration Therapy is used to:

- Replace fluids
- Restore the chemical balance of the body.

Step 2
(15 min)

Technical Comparison of ORS Packets and Homemade Solution

Introduce this step by asking the participants to read the posted newsprint with the "WHO/UNICEF Formula" for Oral Rehydration Solution and the one showing the formula used for preparing homemade sugar-salts solution. Ask the group to discuss the similarities and differences between the two formulas and to explain as best they can the role of each ingredient in these formulas.

Based on their understanding of the previous session (Dehydration Assessment) ask them to give reasons for the formula they would select for:

- preventing dehydration
- treating mild cases of dehydration

Close this step by telling them they will be spending the rest of the session preparing two different OR Therapies; one that should be used at the first sign of diarrhea to prevent dehydration (sugar-salt solution) and the other (ORS) to treat mild dehydration.

Trainer Note

Prepare two sheets of newsprint with the OR formulas that are found in Trainer Attachment 40B.

During the group's discussion of these two formulas make sure that the following points are covered:

- Potassium is an essential element in the body and is lost during diarrhea. A minimum level of potassium is needed for the body to function.
- The amount of salt listed is that amount which is sufficient to replace sodium and water loss.
- Glucose is preferred to sucrose (table sugar) because it helps the body absorb liquid more quickly.
- Sodium bicarbonate helps prevent "acidosis", a condition that decreases the dehydrated child's appetite.
- Mention that as of 1985 the new WHO formula will replace bicarbonate of soda with trisodium citrate which has been found to increase the shelf life of the packets and also appears to reduce stool volume.
- Homemade sugar-salt solutions made properly and used correctly along with other nutrients may prevent dehydration.
- ORS packets which are pre-measured and contain the added ingredients of potassium and bicarbonate of soda or trisodium citrate are important to use when treating mild cases of dehydration and may prevent the need for implementing Treatment Plan C, (IV or Nasogastric Therapy) which is indicated for more life threatening situations.
- None of these solutions once prepared should be kept longer than 24 hours. A fresh quantity should be made daily.

Step 3
(15 min)

Preparing to Mix Oral Rehydration Solutions

Tell the participants they will be working in two small groups, to carry out the following tasks at two oral rehydration stations:

- Read the instructions for preparing the solution at the station you are in and take turns in mixing and tasting that particular solution. (The solutions should taste no saltier than tears.)
- Discuss and complete Handout 40A (The ORT Preparation Worksheet) prior to moving to the next station.
- Clean up the station and leave it in the same state as you found it when you arrived.

Step 4
(75 min)

Preparing Oral Rehydration Solutions

Ask the group to form two small groups and move to their first station and begin preparing the solutions.

Trainer Note

During this step you should:

- Have resource persons who have mixed these solutions placed at each station to observe, correct and assist the participants with any problems or questions they may have. Also this person should make sure each person uses proper hygenic techniques when mixing the solutions (e.g. washing their hands and all utensils before and after making the solution).
- Make sure each station has adequate supplies and ingredients available for each new group.
- Assign each group the task of reporting on one solution. These reports should include information contained in Handout 40A (ORT Preparation Worksheet) and incorporate information from the WHO Diarrhea Treatment Chart as to how much solution should be given, when it should be given and what other fluids and foods should be given when the child is being treated with the preparation that they have been assigned to report on.

15 Minute Break

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Step 5 (30 min) **Discussing the Use of Oral Rehydration Solutions In The Village**

Reconvene the group and ask each small group to report back on their experience at one of the stations. Have someone from each group record the answers on newsprint using the format from Handout 40A. Allow about 5 minutes for each work station report.

Encourage comments and discussion after each presentation.

Ask participants to think about what they have learned and answer the following questions:

- What treatment should be advocated when a child has diarrhea, some signs of dehydration and/or severe dehydration and why?
- What problems do you foresee in getting the community to use and/or prepare these solutions?
- What can you do to overcome some of the problems encountered in encouraging people to use and prepare these solutions?

Trainer Note

Some of the points that should be made during this discussion are:

- Difficulty or lack of understanding in the village related to the accuracy of measuring and mixing the ingredients
- The use of too much salt or sugar
- The need for potassium and bicarbonate of soda or trisodium citrate for treating mild to severe dehydration
- The importance of adapting recipes to the locally available materials used for measuring ingredients
- The cost and possible lack of availability of the ingredients
- The possibility of limited water supply and dirty water.

Step 6 (10 min) **Session Summary**

Ask the participants to summarize the key points that should be taught about rehydration solution preparation and administration in the communities and how they would do this.

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Trainer Note

Information that they should include on how to educate community and family members about home treatment of diarrhea can be found in the WHO Supervisory Skills Module, "Treatment of Diarrhoea", pages 4-6.

ORAL REHYDRATION THERAPY PREPARATION WORKSHEET

Observation Items (1-8)	Pre-packaged Solution (ORS)	Homemade Solution (sugar, salt)
1) List of Solution Ingredients and Amounts		
2) Availability of Ingredients		
3) Length of Time for Solution Preparation		
4) Difficulty of Instructions for Solution Preparation		
5) Problems in Solution Preparation		
6) Materials (Equipment) Needed to Prepare Solution		
7) When to Use the Solution (Treatment Plan A or B?)		

MATERIALS AND EQUIPMENT NEEDED FOR TWO ORAL REHYDRATION THERAPY STATIONS

Introduction

The set-up for these stations is intended to permit participants to learn how to prepare the various kinds of oral rehydration solutions under good and adequate conditions, such as might exist at a health center. As such, facilities here should be organized and clean at minimum.

Each Station should have:

- soap
- water
- source of clean water
- ladle or means of drawing water
- hand towels
- spoons or instruments for mixing
- drinking glasses or cups for tasting solution
- large (over one liter) receptacle to mix the solution.

Station 1: Pre-packaged Solutions

- Proper size containers (usually over one liter but marked to give volume corresponding to exactly one liter) for mixing packets and water
- Large quantity of packets

Station 2: Homemade Solutions: Sugar and Salt

- Proper size container for mixing solution
- Measuring spoons for sugar and salt
- Plenty of salt and sugar (if baking soda is available, include it)
- Knife for leveling measurements

EXPLANATION AND OVERVIEW OF TYPES OF REHYDRATION SOLUTION

HOW TO MAKE HOMEMADE SALT AND SUGAR SOLUTION

A special drink (salt, sugar, and water) can be made to treat diarrhoea and prevent dehydration at home. There are many methods that can be used for measuring the correct amounts of sugar and salt. Following are 2 examples.

Example 1

This example shows a method for mixing 1 litre of special drink.

What you need

A spoon. This should be a small spoon, a "teaspoon," that holds 5 ml (ccs) of fluid or less,

A clean container that will hold 1 litre or a little more,

Salt, as used on food or for cooking,

Sugar of any sort, unrefined lump sugar or purified sugar,

Drinking water (clean or boiled water).

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What to do

1. Measure 1 litre of drinking water into the container. 5 cupfuls or 5 glassfuls are about 1 litre. (See Figure 1)

2. Take salt in a teaspoon, level it with a knife or a flat object (see Figure 2). Add 1 level spoonful of salt to the water and mix the water.

3. Taste the salt and water. It should not be very salty. If it tastes more salty than tears, pour away this mixture and make it again with less salt.

4. Take 8 level teaspoonfuls of sugar. Put these in the water and mix the water.

Figure 1
MAKING SALT AND SUGAR.WATER

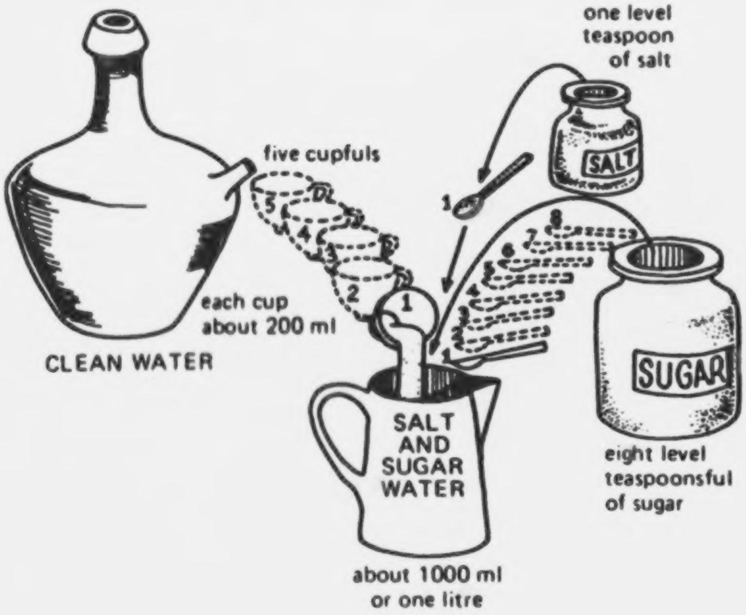
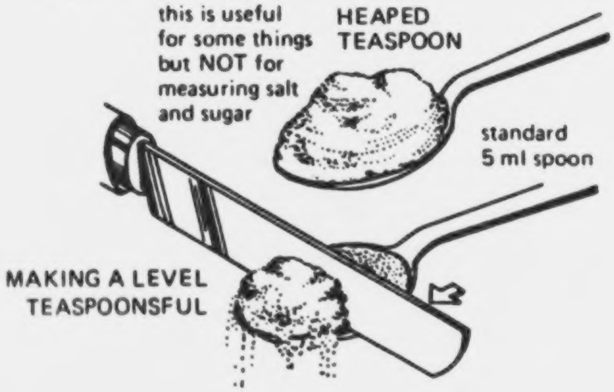

one level teaspoon of salt
SALT
five cupfuls
1
2
3
4
5
1
2
3
4
5
6
7
8
each cup about 200 ml
CLEAN WATER
SALT AND SUGAR WATER
SUGAR
eight level teaspoonsful of sugar
about 1000 ml or one litre

Figure 2. Measuring salt and sugar


this is useful for some things but NOT for measuring salt and sugar
HEAPED TEASPOON
standard 5 ml spoon
MAKING A LEVEL TEASPOONSFUL

DIARRHOEAL DISEASES CONTROL PROGRAMME

WHO/CDD/SER/84.7

ORIGINAL: ENGLISH

ORAL REHYDRATION SALTS (ORS) FORMULATION CONTAINING TRISODIUM CITRATE

1. In 1982-1983 the WHO Diarrhoeal Diseases Control (CDD) Programme supported laboratory studies to identify a more stable ORS composition, particularly for use in tropical countries, where ORS has to be packed and stored under climatic conditions of high humidity and temperature. The results of these studies demonstrated that ORS containing 2.9 grams of trisodium citrate dihydrate in place of 2.5 grams of sodium bicarbonate (sodium hydrogen carbonate) was the best of the formulations evaluated.[1] The formulae of the standard ORS (ORS-bicarbonate) and ORS containing trisodium citrate dihydrate (ORS-citrate) are shown below:

ORS-bicarbonate	grams/litre	ORS-citrate	grams/litre
Sodium chloride	3.5	Sodium chloride	3.5
Sodium bicarbonate (sodium hydrogen carbonate)	2.5	Trisodium citrate dihydrate	2.9
Potassium chloride	1.5	Potassium chloride	1.5
Glucose anhydrous	20.0	Glucose anhydrous	20.0

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TREAT CHILD WITH DIARRHOEA.

Treatment of children with signs of dehydration will involve using a solution made with oral rehydration salts (ORS). Preparation of ORS solution is a skill that all health workers should have.

HOW TO PREPARE ORAL REHYDRATION SOLUTION.

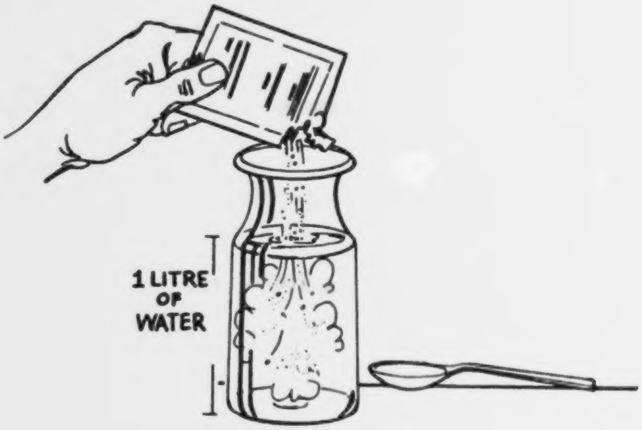
ORS often comes in packets which should contain the following ingredients:

Ingredients	Amount
Glucose (a form of sugar)	20.0 grams
Sodium Chloride-NaCl (ordinary salt)	3.5 grams
Sodium Bicarbonate-$NaHCO_3$ (baking soda)	2.5 grams
Potassium Chloride-KCl	1.5 grams

Packets that contain the ingredients in these amounts are made for mixing in one litre of drinking water. This mixture is called **ORS SOLUTION**. NOTE: Some packets of ORS are made for smaller volumes of water; they have smaller amounts of the same ingredients. When ORS packets are not available, oral rehydration solution can be made using the instructions in Annex 3.

To prepare ORS solution, perform the following steps:

- Wash your hands.
- Measure 1 litre (or correct amount for packet used) of clean drinking water into a clean container. It is best to boil and cool the water, but if this is not possible, use the cleanest water available. Use whatever container is available such as a jar, pot, or bottle.
- Pour all the powder from one packet into the water and mix well until powder is completely dissolved,
- Taste the solution so you know what it tastes like.



Fresh ORS solution should be mixed each day in a clean container. The container should be kept covered. Any solution remaining from the day before should be thrown away.

EXAMPLE Watch the course facilitator prepare the ORS solution according to the steps above.

INTRAVENOUS THERAPY FOR SEVERE DEHYDRATION

1. Technique of administration

The technique of administration of intravenous fluids can only be taught by practical demonstration by someone with experience. Intravenous therapy should be given only by trained persons. Several general points are made here.

The needles, tubing, bottles, and fluid used for intravenous therapy must be sterile.

Intravenous therapy can be given into any convenient vein. The most accessible veins are generally those in front of the elbow, on the back of the hand, at the ankle, or, in infants, on the side of the scalp. Use of neck veins or incision to locate a vein are usually not necessary and should be avoided if possible. In cases requiring rapid resuscitation, a needle may be introduced into the femoral vein where it must be held firmly in place and removed as soon as possible. In some cases of severe dehydration, particularly in adults, infusion into two veins may be necessary; one infusion can be removed once rehydration is well in progress.

It is useful to mark intravenous fluid bottles at various levels with the times at which the fluid should have fallen to those levels. This allows easier monitoring of the rate of administration.

2. Solutions for intravenous infusion

A number of solutions are available for IV infusion; however, some do not contain appropriate or adequate amounts of the electrolytes required to correct the deficits found in dehydration associated with acute diarrhoea. The following is a brief discussion of the relative suitability of each of these solutions.

Preferred solution

- Ringer's Lactate Solution (also called Hartmann's Solution for injection) is the best commercially available solution. It supplies adequate concentration of sodium and potassium, and the lactate yields bicarbonate for correction of the acidosis. It can be used in all age groups for dehydration due to acute diarrhoea of all causes.

Less suitable solutions (ORS Solution by nasogastric tube should be considered as an alternative to the use of the following intravenous solutions.) If they are used, they should be replaced by ORS solution given by mouth as soon as the patient can drink.

- Half-strength Darrow's Solution (also called Lactated Potassic Saline). This solution does not contain enough sodium chloride to correct the sodium deficit and ongoing sodium losses in adults with severe dehydration and continuing severe diarrhoea.
- Normal Saline (also called Isotonic or Physiological Saline): This solution is often readily available. It will not correct the acidosis and will not replace potassium losses. Sodium bicarbonate or sodium lactate and potassium chloride can be given at the same time, but this requires careful calculation of amounts, and monitoring is difficult.
- Half Normal Saline in 5% Dextrose. Like Normal Saline, this solution will not correct acidosis nor replace potassium losses. It also will not provide enough sodium chloride for many adults with acute diarrhoea.

Unsuitable solutions

- Plain Glucose and Dextrose Solutions should not be used as they provide only water and sugar. They do not contain electrolytes and thus they do not correct the electrolyte losses or the acidosis.

3. Providing IV Therapy for Severe Dehydration

The purpose is to give the patient a large quantity of fluids quickly to replace the very large fluid loss which has resulted in severe dehydration.

- Begin intravenous therapy quickly in the amount specified on the table on the following page.

GUIDELINES FOR REHYDRATION THERAPY FOR SEVERE DEHYDRATION*

Age Group	Type of Fluid	Amount of Fluid (per kg body weight)	Time of Administration
Infants (under 12 months)	IV Ringer's Lactate	30 ml/kg	Within 1 hour
	FOLLOWED BY		
	IV Ringer's Lactate	40 ml/kg	Within next 2 hours
	FOLLOWED BY		
	ORS Solution	40 ml/kg	Within next 3 hours
Other children and adults	IV Ringer's Lactate	100 ml/kg	Within 4 hours; initially as fast as possible until radial pulse is easily felt

*The volumes of fluid and rates of administering treatment are averages based on usual needs. These amounts should be increased if they are not adequate to achieve rehydration, or decreased if hydration is achieved earlier than expected or if the appearance of puffiness around the eyes suggests overhydration. Once the health worker has gained some experience in rehydration therapy he may not need to follow this exact schedule.

- For an infant, the entire 6 hour course of therapy should be followed to quickly restore the fluid loss of the severely dehydrated patient. During that 6-hour period, the progress of the rehydration therapy should be assessed after one hour and then every 1-2 hours to determine if the volume or rate of administration needs to be increased. In particular, attention should be given to:
  - the number and volume of stools passed
  - the extent of vomiting
  - the presence of, and changes in, the signs of dehydration
  - whether the rehydration fluid (oral or IV) is being successfully given and in adequate amounts.

(From: WHO Supervisory Skills, "Treatment of Diarrhoea".)

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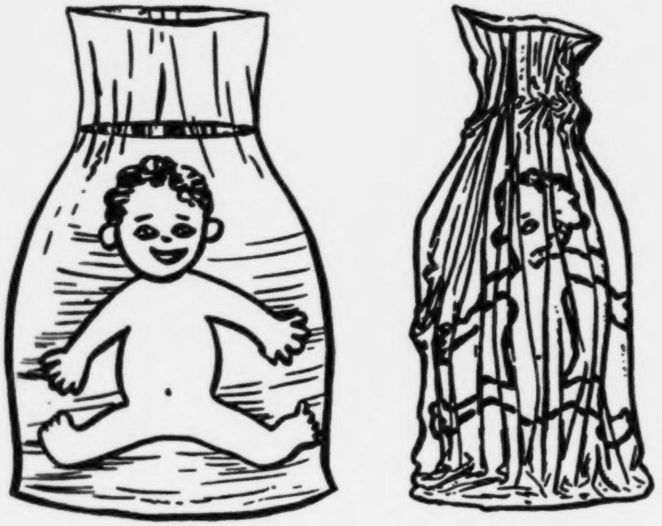
USING MODELS TO DEMONSTRATE DIARRHEAL DEHYDRATION

Take a clear plastic bag with no tear or hole in it. With a felt-tip pen (the kind with waterproof ink) draw a picture of a baby on it (Fig. 30). Fill the bag with water; the picture of the baby will be full and well-rounded, like a healthy child. Now make a small hole in the lower part of the bag with a pin. As water flows out, the bag and the picture will become wrinkled. This shows what happens to a child who has diarrhoea and becomes dehydrated.

Ask a trainee to pour water into the bag faster than it is flowing out of the hole. This shows what happens with oral rehydration; the picture of the baby will become normal again. Now seal the hole with a piece of tape or sticking plaster so that the water stops flowing out. This shows that the diarrhoea has stopped and no more rehydration is needed.



(Fig. 30)
PLASTIC BAG MODEL
TO DEMONSTRATE DEHYDRATION

A clay pot with a hole underneath or low on one side may be used as a model instead of the plastic bag. Plug the hole with a stick or a cork. Hang the pot from a weighing scale and fill it with water. Removing or loosening the plug, show how the weight becomes less as the water flows out (diarrhoea and dehydration), and how the weight increases again as more water is poured in at the top (rehydration). Ask the trainees to make a note of the weight when the pot is full, when some of the water has drained out, and when the pot has been filled again and the plug has been put back. Make sure that the weight is the same at the end of this exercise as it was at the beginning.

This exercise can be used by community health workers to teach parents about dehydration and rehydration. They should take the opportunity to discuss with the parents the causes and dangers of diarrhoea and the means of preventing it.

(Adapted From: WHO, Guidelines for Training Community Health Workers in Nutrition. pg. 111)

Five Steps of Diarrhea and Its Management

ORAL REHYDRATION THERAPY (ORT) FOR CHILDHOOD DIARRHEA

Summary. About one of every 10 children born in developing countries dies of diarrhea before reaching the age of 5. Oral rehydration therapy (ORT) can substantially reduce this heavy toll. ORT means drinking a solution of water, sugar, and mineral salts to replace the water and salts lost by the body during diarrhea. This counteracts dehydration, which is the direct cause of diarrhea deaths. Making this simple, inexpensive, and effective treatment available throughout the world is a major public health challenge.

The scientific rationale for oral rehydration is firmly established. During diarrhea the body rapidly loses fluids and the electrolytes sodium, potassium, chloride, and bicarbonate, while at the same time the ability of the intestines to absorb fluids and electrolytes, in the form of salts, taken by mouth is impaired. About 10 percent of diarrhea episodes lead to dehydration and, if untreated, one or two percent become life-threatening. When the body becomes dehydrated, the only effective treatment is rehydration — replacing, either intravenously or orally, approximately the same volume of water and electrolytes lost.

WHO Complete Formula

The formulation for oral rehydration (OR) solution now recommended by the World Health Organization (WHO) contains the following ingredients:

sodium chloride	**3.5 grams**
sodium bicarbonate	**2.5 grams**
potassium chloride	**1.5 grams**
glucose	**20 grams**
water	**1.0 liter**

These ingredients are now distributed internationally by the United Nations Children's Fund (UNICEF) in packets labelled Oral Rehydration Salts, or ORS.

The WHO complete formula is widely regarded as the physiologically most appropriate single formulation for worldwide use. Although some pediatricians have argued that it contains too much sodium for infants, public health practitioners point out that continued breast-feeding or drinking other fluids in addition to OR solution minimizes this risk.

The major issue today is not the composition of the ORS packets but rather the provision of necessary services and essential supplies to all who require them. To provide the needed six packets per child under age 5 per year to all developing countries except the People's Republic of China would require 2,400 million packets annually. UNICEF is currently producing about 24 million packets. This amount is less than the 50 to 60 million estimated as necessary for Egypt alone. A number of commercial firms and national governments assisted by UNICEF are producing packets locally and more plants are being set up, but providing a continuous supply of prepackaged salts is an important constraint for national programs.

Another problem is cost. At the lowest competitive price, UNICEF currently pays about 8¢ (US) per packet — including 2.5¢ for the ingredients and 2¢ for secure, watertight foil packaging. Even at this low price, however, health ministries in most developing countries cannot afford prepackaged ORS supplies for every family. For many developing countries, the cost of providing six packets of ORS per child a year would amount to 10 to 20 percent of the total health budget.

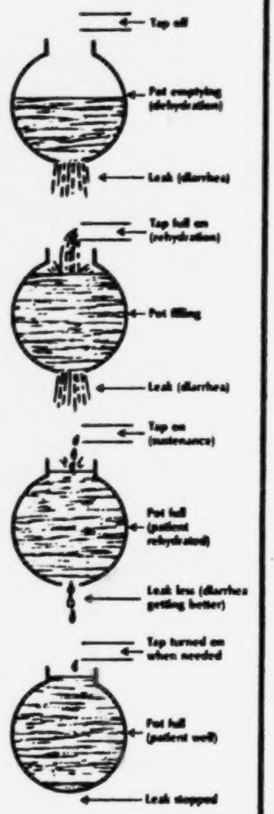
Homemade Sugar and Salt Solutions

One answer to the twin problems of cost and distribution is to encourage home preparation of an OR solution consisting of only sugar and table salt. Since sugar and salt are available in most households and since potassium and bicarbonate may not be essential in the early stages of diarrhea, several programs are experimenting with home-mixed solutions.

This approach raises two concerns: First, will the solutions be accurately mixed? If too much salt is used, the solution may be dangerous. If too little salt, it may be ineffective. (The

A cup and spoon should be used to give ORS to breast-fed infants, and older children can drink right from the cup. Baby bottles should not be introduced for administering ORS because their use may discourage breast-feeding. (InterVista Advertising Ltd., Jakarta/Nuradi)

The Five Steps of Diarrhea and Its Management


Tap off
Pot emptying (dehydration)
Leak (diarrhea)
Tap full on (rehydration)
Pot filling
Leak (diarrhea)
Tap on (sustenance)
Pot full (patient rehydrated)
Leak less (diarrhea getting better)
Tap turned on when needed
Pot full (patient well)
Leak stopped

Step 1. Dehydration. The person with diarrhea is like a pot of salt water with a hole in its bottom. A dead patient is like an empty pot. It is most important to keep the pot full.

Step 2. Rehydration of the patient with salt and water is like filling the pot. *It must be done quickly, within six hours or less.*

Step 3. Sustenance of the patient is like keeping the pot full with salt water while the leak continues, and at the same time making the patient stronger by feeding him with the proper food.

Step 4. Cure of the patient is when the leak stops and the pot is full.

Step 5. Prevention is trying to stop the beginning of further leaks by keeping people strong and healthy; but if a leak starts again, prevention is by giving salt water and food before the "pot starts to empty" (i.e., before the patient dehydrates).

Source: WHO (225)

same problem, although less severe, arises with packets.) Experience in Indonesia and Bangladesh as well as a pilot study in the Philippines suggest that people need careful, repeated, face-to-face instruction to mix solutions correctly. Second, will sugar and salt solutions be effective? The absence of potassium and bicarbonate may limit effectiveness in severe cases of dehydration. In mild cases where intestinal absorption is not impaired, it is possible that almost any fluid might prevent dehydration. More research is needed to determine whether complete-formula or sugar and salt solutions prevent dehydration better than other available fluids such as rice water, green coconut water, or soup.

Continued Feeding

Malnutrition is an important element of diarrhea. Many children in developing countries are malnourished. Frequent episodes of diarrhea contribute to malnutrition because appetite diminishes, feeding is interrupted, and absorption of nutrients is reduced. Malnourished children then become more vulnerable to infections, creating the potential for a vicious cycle of malnutrition and infection.

ORT programs emphasize continued feeding during diarrhea. Even though some families, folk practitioners, and Western-trained physicians have traditionally recommended withholding food during diarrhea, the consensus today is that breast-feeding should not be interrupted at all during diarrhea. For a child who has been weaned, feeding should be interrupted only briefly; liquids with low lactose content such as dilute formula or other usual fluids and foods should be resumed as soon as the child will take them. Although the volume of diarrhea may be greater with feeding, the volume of food absorbed is also greater when feeding is maintained, and the amount of weight loss is less.

ORT programs discourage the use of antibiotics and other drugs since they are ineffective against the viruses that cause most childhood diarrhea and they are sometimes harmful. Neomycin, for example, makes diarrhea worse. Vaccines against a few specific viruses are under development.

Community-Based Programs

In the long run only modern sanitation, clean water, better nutrition, and improved living conditions can reduce the incidence of diarrhea among infants and children. But in the short run the scientific knowledge and the practical technology embodied in ORT already exist to prevent most deaths from diarrhea. Can health programs meet the challenge of making ORT available all over the world?

The scope of the task requires careful planning, with specific objectives, reliable logistics, community-wide training, well-designed information programs, and close monitoring and supervision of a multitiered treatment system. While coordination must extend from headquarters all the way down to the village, treatment of severe cases should proceed from the home, to the village or peripheral health worker, to the health center, to the hospital.

On one hand, the full understanding and cooperation of the medical community is necessary to provide back-up and referral for the most severe cases. This may require refresher courses and seminars because the rationale for oral rehydration was developed after many physicians now practicing went to medical school. On the other hand, in order to reach the millions of mothers who actually care for children with diarrhea, community-based programs that do not depend on doctors and clinic facilities are essential. That means every family in every village should have supplies available and be carefully taught and encouraged to use them.

(From: Population Reports. Series Number 2, November-December 1980.)

Session 41

TREATMENT, PREVENTION AND CONTROL OF SELECTED ENDEMIC DISEASES

TOTAL TIME 4 Hours

OVERVIEW Water and sanitation related diseases are major causes of illness and death among people in both rural and urban areas in many developing countries. The health and well being of people cannot be improved without undestanding these diseases and knowing how they are transmitted.

This session addresses four diseases commonly found in the developing world that are related to water and sanitation. These diseases are Schistosomiasis, Onchocerciasis, Dracunculiasis (guinea worm), and Malaria.

To enable participants to develop effective health education programs about the diseases most prevalent in their assigned countries, this session reviews the clinical signs and symptoms of the aforementioned diseases, the age at greatest risk and the appropriate, treatment, prevention and control measures

OVERVIEW

- To describe the signs, symptoms and transmission of certain endemic disease. (Step 1)
- To select appropriate measures to control and treat these diseases. (Steps 1, 3)
- To develop a story with pictures that promotes the recognition, prevention and treatment of the diseases. (Step 3)
- To identify ways in which cultural practices affect the recognition and treatment of these diseases. (Steps 3, 4)

RESOURCES

Control of Communicable Diseases in Man

Handouts:
- 41 A Background Information on Malaria
- 41 B Background Information on Onchocerciasis
- 41 C Background Inforamtion on Dracunculiasis
- 41 D Background Information on Schistosomiasis

Trainer Attachments:
- 41 A Treatment Schedule for Malaria
- 41 B Problem Story

MATERIALS

Newsprint, markers, drawing and tracing paper, colored pens and crayons, erasers, tape, and rulers.

PROCEDURE

Trainer Note

Prior to this session, determine which diseases are most endemic to the country and obtain as much information about these diseases as possible. Handouts 41 A-D have been prepared for four diseases that (with the exception of Guinea worm) are most prevalent worldwide. If some other diseases are more prevalent in the country where you are training develop a fact sheet that contains the same basic information on these diseases. You should also obtain information pertaining to any cultural beliefs and or behaviors that may affect the transmission of these diseases and inform the participants of this information.

Select in advance of the session, participants to develop and present a brief (10-15 minute) lecturette on each of the two or three locally endemic diseases. Give them the fact sheet for the lecturette they will present. Tell them that you will be available to help with their preparations and to refer to Helping Health Workers Learn and Where There is no Doctor for ideas on how to present these lectures and for possible sources of visual aids they can adapt and use during their presentations. Prepare the story and picture you will present in Step 2, prior to this session.

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Step 1 (30-40 min)

Lecturette on the Selected Disease

Ask the volunteers to present the lecturettes on their selected diseases and to be prepared to answer questions after their presentation.

TRAINER NOTE

The points that should be made during their lecturettes are:

- The mode of transmission
- The clinical picture
- Overall methods of control and prevention
- High risk groups
- Cultural factors or customs that affect transmission or spread of the disease.

Step 2 (25 min)

Story

Introduce this activity by stating that you will tell a story you would like to discuss afterwards. Recite the story or an adaption of the one found in Trainer Attachment 41B. While reciting the story, present a picture that depicts one of problems at the beginning of the story and a second poster which visually presents the resolved situation at the end of the story. Hang these posters on the wall opposite each other with a large gap between them. When the story is completed ask the participants the following questions:

- What caused the problem?
- What action was taken to solve the problem?

When a solution is mentioned have the participant who offered the solution place a link between the two pictures. Continue until the participants have no more suggestions. Ask the participants to also list the resources that are needed to accomplish the solution they are offering and the steps that must be taken to access these resources.

Step 3 (80 min)

Preparing Their Own Story with Gap

Ask each participant to select one of the diseases discussed in Step 1 for which they would like to prepare a story similar to the one you have presented.

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Inform the group that:

- They will have 80 minutes to prepare a story with pictures that depicts a problem (cause of disease) and the solution.
- They should state the problem at the beginning of the story, and design a series of small posters representing steps or appropriate health messages that will promote the appropriate control measure which leads to the stated solution.
- The story should not state how the characters resolved the problem. (These solutions must come from the other participant.)

Have them form working groups around the disease they selected. Ask the participants who presented the lecturettes in Step 1 to act as technical consultants to the group that selected their diseases.

Trainer Note

Inform the participants that the purpose of their story is to involve villagers (in this case the other participants) in a critical analysis of their own situation and to encourage them to set goals, to change behaviors, beliefs or practices. Refer to Session 22 (Selecting and Using Nonformal Education Techniques) for guidelines on use of Pictures to stimulate discussion.

Tell them that their story should include local customs, humourous characters or dramatic situations, and be no longer than 10-15 minutes. They should include any information they learned during their cross-cultural studies and language trainers should also be available to act as resources.

10 MINUTE BREAK

STEP 4
(40-60 min)

Presenting Their Problem - Stories

Ask each group to present their stories and appropriate pictures to the large group. When the story is completed, have them ask the group these questions:

- What caused the problem?
- What do you think the family/village/clinic/PCV could do to solve this problem?

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When a solution is mentioned, have the storytellers pass out the small poster that has a picture of the solution. If there is no poster for a mentioned solution, give out a blank paper and ask for the person to illustrate the solutions and give his or her reasons for proposing that step. Finally, at the end of each story, have the participants list the resources necessary to carry out each step required to accomplish the solution and to state how those resources could be obtained.

Step 5
(15 min)

Bridging the Learning Cycle

Facilitate a review of the session by asking the group to recall the principles they learned in their earlier sessions on health education. In particular, ask them to evaluate this session in terms of:

- The criteria stated in Session 25 (Designing and Evaluating Health Education Sessions) and the use of pictures to stimulate discussion in Session 22 (Selecting and Using Nonformal Education Techniques).
- How well the sessions worked for them in terms of learning and applying new information.
- How useful the methods they used (lectures, picture stories, visual aids) will be in transferring skills and knowledge they have to people in their assigned work sites.
- Was the information on the handouts presented in a way that facilitated their understanding of the signs and symptoms of the disease and how and whom to treat.
- Would this be a useful way to present this information to health workers, schoolteachers and students.

Malaria

Disease Transmission

Malaria in humans is normally transmitted by the bite of a female Anopheles mosquito that is infected with 1 of 4 species of the genus Plasmodium (P. falciparum, P. malariae, P. ovale, or P. vivax). As the mosquito feeds from the human bloodstream, it releases malaria sporozoites, which enter liver cells (exoerythrocytic stage). After the parasite matures, the liver cell ruptures and releases numerous merozoites. These invade red blood cells (RBCs), starting the erythrocytic stage of an infection. Within the RBCs the parasites mature, become schizonts, and divide again into merozoites. Finally, the infected RBCs rupture, and merozoites repeat the cycle by invading other RBCs. The release of merozoites from erythrocytes initiates the chills and fever of a typical malaria attack (convulsion).

Clinical Picture

Malaria is characterized by fever, sweats, chills, headache, body pain and in severe cases unconsciousness and death. In infants the presenting signs of malaria can be subtle and quite variable and may include poor appetite, restlessness and lethargy.

Geographic Distribution

In Asia the known range is from West Iran and Assan Burma. In the Americas the range and distribution covers most of tropical South America east of the Andes, both the Caribbean and Pacific sides of Columbia and Panama. In Africa it is mainly located in the Sub-Saharan countries.

Age Groups

Although persons of all ages can get Malaria, two groups are at special risk of becoming severely ill and dying: children under five years of age and pregnant women.

Control Measures

For most countries, eradication of Malaria in the near future is unlikely because of the lack of resources, including health infrastructure and completely effective intervention mechanisms. Limited health budgets restrict the scope of malaria control activities. Most malaria control programs have the goal of reducing deaths caused by malaria. The use of anti-malarial drugs, especially chloroquine, to treat all fever cases, is expected to reduce malaria-caused deaths when given to a sick individual promptly. The use of chloroquine for treatment of fever should be promoted especially for the two groups in the population at highest risk of death due to malaria--pregnant women and children under five.

Because the *P. facliparum* malaria parasite is becoming increasingly resistant to chloroquine in some areas of East Africa, each country needs to monitor the sensitivity of local strains to chloroquine. A method for doing this is well developed and available through national health authorities.

Anti-malarial Drugs

Anti-malarial drugs can safely and effectively reduce and/or eliminate malaria parasites in a person's blood as well as be used to prevent the disease. Even in areas where chloroquine resistance exists, chloroquine will remain an important therapy because it may be effective for many of the local infections and it is safe and inexpensive.

Two measures recommended to reduce the effects of malaria on the health of pregnant women and children under five are:

Presumptive Treatment: Treatment is called "presumptive" because, without examining a blood smear to confirm the presence of parasites, it is *presumed* that the fever is caused by malaria and that the child will respond to treatment with chloroquine. Chloroquine is given to children who have fever and/or other signs and symptoms of malaria. The amount of chloroquine that is given depends on the weight (or age) of the child and if the country is in an area with suspected resistance.

Drug Prophylaxis: Prophylaxis means preventing infection of illness. Severe malaria in pregnant women can result in abortion. A pregnant woman who takes chloroquine or another malaria prophylactic at appropriate intervals should be protected from malaria. It is recommended to give a pregnant woman two 150 milligrams (mg) chloroquine base tablets (300 mg) per week to prevent malaria from harming the mother and her developing baby. She should not develop symptoms even if she is bitten by an infected mosquito.

Mosquito Control

Anopheles mosquitoes (larvae and pupae) are the vector (carriers) of malaria. The pre-adult (larvae and pupae) development occurs in water. Water sources ranging from standing rain water to lakes and rivers are used as breeding sites by different species of *Anopheles*. The number of developing mosquitoes may be reduced by killing larvae in breeding sites. This can be done by draining or filling stagnant water collections with earth. It can also be done with periodic application of petroleum-based sprays or insecticides to stagnant water breeding places.

The adults, or flying stages of the mosquito, often rest on the walls of houses. To kill adult mosquitoes, insecticides can be sprayed on the inside walls of houses at regular intervals. Pesticides can be sprayed in the air as "mists" or "fogs" to kill flying adult mosquitoes. The widespread use of insecticides to control malaria has limitations, however. Insecticides are toxic and expensive, and the costs continue to increase.

Individual Protection

People can protect themselves from mosquito bites by screening the windows of their houses or sleeping rooms, by using mosquito netting around their beds, by applying mosquito repellants to their bodies and clothes and by helping to eliminate breeding locations in their communities. While such anti-mosquito measures will reduce the risk of malaria transmission, they may be too expensive for wide application in many countries.

(Adapted From: CDC/CCCD Draft Training Manual: Target Diseases.
CDC MMWR Prevention of Malaria in Travelers, 1982. and
Benensen, A., *Control of Communicable Diseases in Man*)

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Onchocerciasis

Disease Transmission

Onchocerciasis is common in areas where specific types of blackflies (genus simulium) breed. Usually the best breeding grounds are fast-flowing rivers and streams. The blackfly spreads the disease in the following manner.

- The blackfly bites a person who is infected with onchocerciasis.
- The larvae of the parasite are taken from the skin of the person and pass with the tissue juices into the blackfly.
- In the fly, the larvae become infective in about six to ten days. When the fly bites again the larvae pass from the fly into the person.
- Lumps form under the skin. These nodules contain adult round worms which produce large numbers of larvae that live in the skin waiting to be sucked up by a blackfly.

Of the millions of larvae, only a few are taken in by blackflies. The rest wander through the host's tissues until they die in the human body. The body tries to fight the effects of the dead larvae by building scar tissue around them. These scars form in the body. Many larvae die in the lens and other parts of the eye. Eventually, the lens becomes so full of scar tissue that the person becomes blind.

The nodules containing the adult worms are not always easy to detect because they may be deep in the body. Generally the presence of nodules, patches on the skin and itchiness are symptoms of onchocerciasis.

Geographic Distribution

Geographical distribution in the Western hemisphere is limited to Guatemala, southern Mexico, northern Venezuela, Columbia and Brazil. In Africa it is mainly found south of the Sahara, in an area extending from Senegal to Ethiopia, down to Angola in the west and Tanzania in the east. One of the largest endemic areas occurs in the Volta River basin area, which incorporates Benin, Ghana, Ivory Coast, Mali, Niger, Togo and all of Burkina Faso.

Clinical Picture

Onchocerciasis is recognized by an intense itchy rash, altered pigmentation, swelling and wasting of the skin and some systemic effects. The most important lesions are those of the eye, which lead to serious loss of vision and blindness.

Control Measures

Control of the disease is focused on the control of the blackfly population through environmental and chemical means. Treatment is not very effective since the disease is sometimes difficult to detect. However, early treatment that kills the adult worms will help prevent blindness. The following control measures are recommended for fighting the spread of onchocerciasis.

Environmental Control. Environmental control of onchocerciasis involves eliminating the breeding sites of the blackflies. However, it is very difficult to control the disease just by environmental means. Some measures that are useful are also expensive and will be beyond the means of most rural people. Environmental measures that can be used to control onchocerciasis should be included in development projects. For example:

- Because most species of blackflies, particularly in Latin America, require fast-flowing water in which to breed, changing the stream flow can greatly help to reduce the numbers of blackflies. To eliminate the breeding places of blackflies upstream, a dam can be built. The backed-up water floods the fast-water breeding grounds.
- The design of dam spillways so that new breeding places are not created in them is not easy. Professional help should be sought in such design from specialists with experience in controlling blackfly breeding. Do not build spillways in a series of steps because this design will only increase the reproduction of the flies, and succeed in moving the breeding place from one point to another.
- Build covered canals when developing an irrigation project. Covered canals are expensive and, in most cases, existing canals cannot be covered. When designing new systems, engineers should consider the added cost of covering in order to control blackfly breeding.

- Remove brush from the edges of fast-flowing rivers and streams.

Generally, little environmental control can be carried out where structures are already in place. Changing dams or canal design is economically impossible. Only where new projects are in the design stage can effective measures be included in a project. Where new communities are being proposed, an attempt should be made to locate them away from areas where blackflies breed. To more effectively fight the spread of onchocerciasis, a good program of chemical control should be established.

Chemical Control. By placing chemicals into breeding water, large numbers of blackflies can be destroyed. The larva stage of blackfly development is the time when control is effective. Chemicals kill blackfly larvae before they can mature.

Chemicals kill the larvae in three ways:

- The larvae eat the chemicals and are poisoned.
- The chemicals kill the larvae through contact.
- The larvae starve or smother when the chemical forces them to move away from their habitat.

Several chemicals are available for use in controlling blackfly populations. DDT has been used but because of the danger it presents to fish and animals, its use has been limited. Other effective, less dangerous chemicals are available.

Abate is the most commonly used chemical for blackfly control. Generally, it is applied to streams or other bodies of water where blackflies are known to breed using an airplane or helicopter. Methoxychlor is less commonly used than Abate because it is less powerful and a less effective killer. Methoxychlor is much less expensive than Abate and for that reason is often used. Both chemicals appear to be safer than DDT but both of them affect fish.

The choice of a chemical will depend on availability and price. Chemicals can be applied by pouring them directly into the water or by constructing a drop applicator.

The chemicals are lighter than water and float at the top where blackfly larvae live. This also protects fish and plants that generally live below water. Where rivers have a continuous rate of flow over long stretches, single doses at a specific point can be applied. If the river has rapids and pools, the chemical will have to be applied at the headwaters of each set of rapids.

Treatment and Education

Where onchocerciasis is suspected, a medical skin test is necessary to determine its presence. Also, the disease can be detected with an eye examination.

When the nodules appear on the body, they can be removed by surgery. Early removal lowers the number of worms in the body. However, when the nodules are inside the body and not easily detected, this measure is not useful. Removal of nodules from all people with the disease would be very time-consuming and virtually impossible.

Another possibility is to use drugs to treat people with the disease. There are drugs which kill the larval parasites in the body and drugs that kill the adult worm. No drug does both. The problem with drug use is:

- Drugs have severe side effects.
- Drug treatment can only stop the symptoms and prevent further damage.
- Drug treatment is expensive and not practical over large areas.

To control river blindness, it is very important to eliminate breeding places. People should be taught about the disease and how it is spread. Once an awareness of the disease is created, people will be more interested in cooperating in blackfly control programs. Community members should participate in and take responsibility for spraying programs and brush clearing. Instruct people in the importance of using netting when sleeping outdoors, especially during the daytime when the flies bite. Above all, help people to recognize the symptoms of the disease so that they can get medical help quickly.

(From: Water for the World Tech. Note Dis. 2. M.5)

Dracunculiasis (Guinea Worm)

Disease Transmission

It is transmitted only by drinking water. The mature female worm pierces the skin, causing a blister or an ulcer. When the blister or ulcer is in contact with water, the worm discharges larvae into the water. The larvae are swallowed by crustacea of the genus cyclops and in about 2 weeks develops into the infective stage. Typically contaminated sources of water are stagnant ponds or step wells. Guinea worms enter man when he drinks from this contaminated water. The larvae migrate quickly to the wall of the first part of the small intestine (duodenal wall) and proceed to the abdominal and thoracic cavities where they begin maturing in connective tissues. Approximately one year after initial host infection the worm migrates to a subcutaneous position, usually the lower leg or foot where it causes a painful blister to appear. When the affected part of the body is immersed in water the blister ruptures emitting hundreds of millions of larvae into the water.

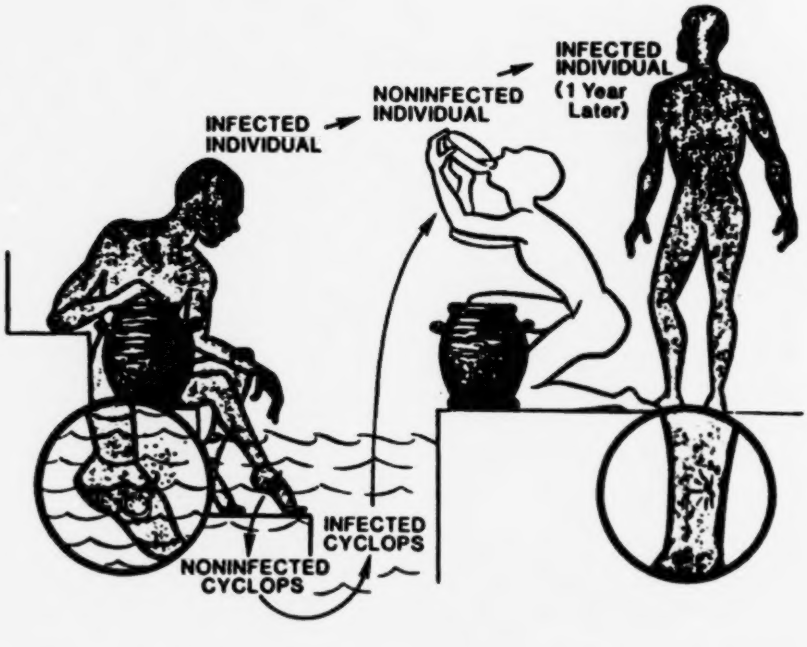


FIGURE 1 Life cycle of Dracunculus medinensis. (Source: Centers for Disease Control 1981)

Clinical Picture

Infected people exhibit no signs or symptoms until the female worm matures and is ready to emerge. A blister appears, usually on a lower extremity, especially the foot, as the meter-long adult female worm prepares to discharge its larvae. Burning and itching of the skin in the area of the lesion and frequently fever, nausea, vomiting, diarrhea may accompany or precede vesicle formation.

Geograhic Distribution

This parasitic infection occurs most frequently in West Africa and in Western and Southern India, principally in the rural areas. Depending on the climate, dracunculiasis occurs in one of at least three seasonal patterns. In semiarid areas, transmission occurs in the rainy season. Since the incubation period averages about 12 months, the transmission season remains synchronized with the annual period when the local environment is most receptive to the parasite.

In areas where there are surface sources of water year-round, transmission usually occurs during the dry season, when the surface sources are scanty and most polluted. In some other areas, transmission may occur year-round with either seasonal variation.

Age Group Affected

Adults between the agers of about 16 and 45 are usually most infected. Young children and very old people are much less likely to acquire the disease, because it is speculated that they do not drink as much from contaminated shallow ponds and wells near agricultural fields.

Control Measures

Dracunculiasis can be controlled by:

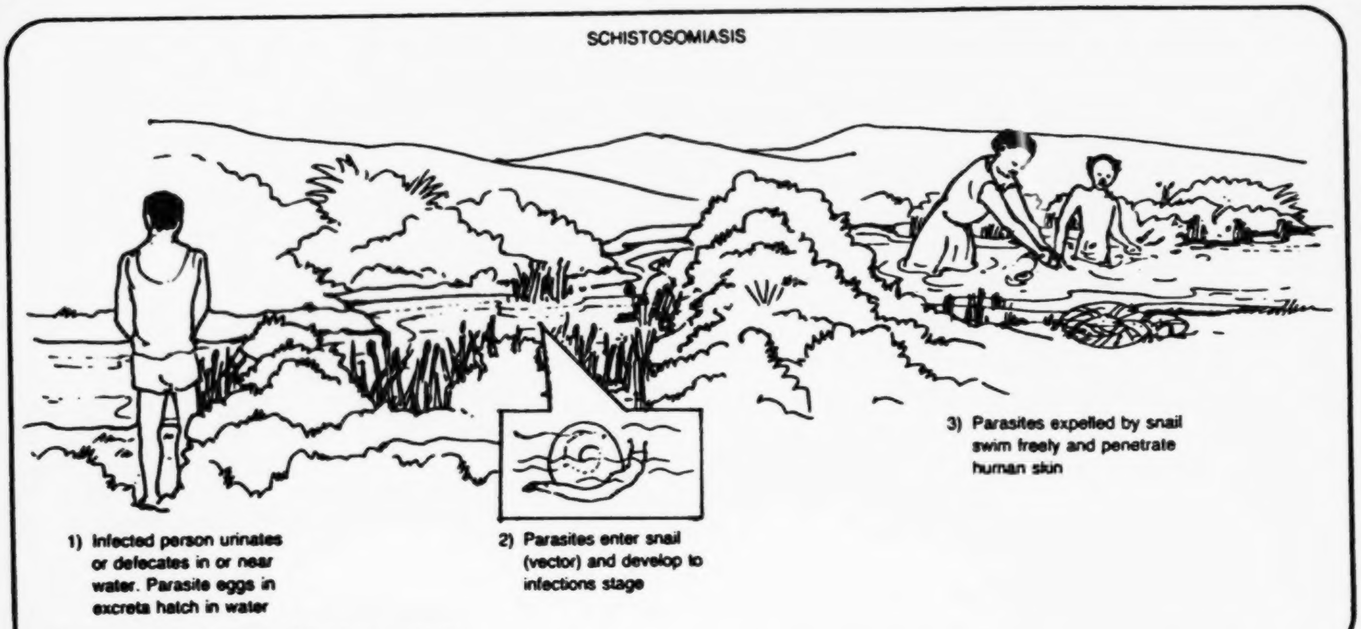
- providing safe drinking water
- educating villagers to filter their drinking water through a cloth or boil it, or
- using Abate (temephos), an insecticide with a wide margin of safety for humans, to treat drinking water sources periodically, or
- educating victims not to contaminate drinking water sources, or
- some combination of the above.

Schistosomiasis

Disease Transmission

Schistosomiasis which is caused by a parasitic worm that lives inside the veins of the intestine or urinary bladder affects many people who live near fresh water or irrigation projects. The parasite must spend part of its life in a snail. It is spread in the following manner:

- A person with schistosomiasis passes worm eggs in urine or feces that get into water.
- In the water, the eggs hatch as larvae which seek and enter specific types of snails.
- In the snail, they form a sac in the liver where forked-tailed larvae are produced.
- Each day many scores of the larvae escape from the cyst into water where they seek contact with a person.
- On contact with skin, the parasite actively penetrates and travels through the bloodstream to the veins of the intestine or bladder. The parasites grow and lay eggs which are passed in urine or feces to continue the process of transmission. Figure 1 shows how schistosomiasis is transmitted.



1) Infected person urinates or defecates in or near water. Parasite eggs in excreta hatch in water

2) Parasites enter snail (vector) and develop to infections stage

3) Parasites expelled by snail swim freely and penetrate human skin

Figure 1. Transmission of Schistosomiasis

Although an itchy rash can develop around the place on the skin where the parasites enter, and an affected person can have a fever and cough for two to four weeks afterwards, serious damage comes later when the worms reach adulthood and begin laying eggs. The body reacts to the eggs as they migrate through the wall of the intestine or bladder or are carried by the blood flow to other parts of the body. A person with schistosomiasis can have tumors, sores that do not heal, internal bleeding, diarrhea, a bloated abdomen caused by accumulated fluids, liver and spleen damage, and other symptoms. Sometimes the eggs can even cause heart, lung, and brain damage. Schistosomiasis is a very serious health problem. Even people who have a mild infestation can feel tired all the time, be drowsy and unable to concentrate on work, have stomach cramps and lose weight. While few people die from schistosomiasis, many people suffer a great deal because of it and die of other diseases because of their weakened condition. Since so many symptoms can indicate schistosomiasis, it can only be positively diagnosed when living eggs of the parasite are found in a stool or urine specimen, or when some other medical test is performed.

Clinical Picture

Schistosomiasis or bilharziasis is a disease that results from poor sanitary practices and from the development of projects to promote irrigation and provide hydroelectric power. An itchy rash can develop around the place where the parasites enter, or an affected person can have a fever and cough for two to four weeks afterwards. A person can have tumors, sores that do not heal, internal bleeding, diarrhea, a bloated abdomen caused by accumulated fluids, and liver and spleen damage. Even people who have a mild infestation can feel tired all the time, be drowsy, have stomach cramps and lose weight.

Geographical Distribution

S. mansoni is found in Africa, northeastern and eastern South American and some Caribbean islands. *S. baemotobium* is found in Africa and the Middle East. *S. japonicum* is found in China, Japan, Philippines and Sulawesi; in some endemic areas more than half of the population is infected. *S. mekongi* is found in the Mekong River area between Laos and Cambodia. *S. intercalatum* occurs in parts of West Africa, including Cameroon, Zaire and Gabon. Human infections with *S. bovis* have been found throughout Africa. None of these species is indigenous to North America.

Control Measures

The composition of any control program will necessarily vary according to the emphasis placed upon one or more different approaches with respect to local conditions, objectives of the control program, available resources, and the strategy employed. Three types of control measures can be employed. They are:

- Chemotherapy - This measure reduces the output of live eggs from the patient's body and, in doing so, diminishes transmission.
- Snail control by chemicals (molluscicides) - This type of control reduces the spread of disease.
- Control by environmental modification - The advantage to this type of control measure is that permanent changes can be made that have a lower maintenance cost than other methods of control.

Chemotherapy

By killing worms in the treated individual, this type of treatment reduces the risk of morbidity and mortality due to the disease (primary control) and also enables the patient to recover from reversible lesions (secondary control).

In situations where there are operational constraints priority must be given to the heavily infected or to other high risk groups such as school children. The recommended drug of choice for the treatment and control of cases is Praziquantel. Alternative drugs are oxaminiquine for simansoi; Niridizole or metrifonate for S. hemathobium; and Niridizole or Stibocapote for S. Japonicum.

Snail Control

Snail control by molluscides is a rapid and effective means of reducing transmission. Its efficiency is enhanced if it is combined with other methods of control. It is most cost-effective where the volume of water to be treated per person at risk is small. Irrigation schemes, in which controlled water-management is practiced and where population density is high, are well suited to cost effective chemical molluscicIding. The use of molluscicides has the following advantages:

- the chemicals can be put in the water by one agency, and a small group of people can treat an entire area;
- the snails are completely, or almost completely, or almost completely, gone for a time, so a high level of control is possible; and

There are some disadvantages to chemical use, however:

- some chemicals that kill snails also can kill fish, or water plants;
- it is possible that the snails in an area may eventually become resistant to the chemical used to kill them, though this has not happened yet;
- improper use of a chemical--putting far too much in the water, for example--can be harmful to people; and
- chemical application must be repeated.

The following table lists the various molluscicides and specific information about them. The choice of chemicals depends upon local availability and price.

Table 1. Molluscicides and Their Properties

	BAYLUSCIDE (Niclosamide)	FRESCON (N-tritylmorpholine)	COPPER SULFATE	SODIUM PENTACHLORPHENATE	YURIMIN
Does it usually kill fish?	Yes	No	No	No	No
Does it kill plants?	No	No	Yes	No	No
Does it kill snail eggs as well as adult snails?	Yes	No	No	No	Yes
Is it affected by sunlight?	Yes	---	No	Yes	No
Is it affected by whether the water is running?	Yes	No	Yes	No	---
What forms are available?	Powder, emulsion	Emulsion	Powder	Flakes, pellets, briquettes	Granules
How soluble is it?	230 ppm[*] (pH dependent)[**]	---	32%	33%	Very slight

[*] parts per million
[**] how alkaline or acid the water is

Environmental Control

Changing local conditions and practices are very important in controlling the spread of schistosomiasis. Great progress can be made with improved sanitation and more appropriate irrigation methods. The following measures are extremely useful in controlling the spread of schistosomiasis.

- Educate the people about the disease. Develop an education program that adequately explains the link between poor sanitation and the spread of the disease. Teach preventive measures.

- Encourage people to build and use latrines for both urinating and defecating. Neither urine or feces should ever be passed directly into a stream or other body of water. If health education persists people will be aware of the need to use latrines and will build them. Instruct families in the use and care of latrines so that conditions are sanitary.

- Make sure that there is an adequate supply of good quality (uncontaminated) water near the community. A protected source should provide sufficient water for drinking, bathing and washing clothes, especially in areas where there is schistosomiasis. People should be encouraged to develop good water sources and to avoid entering infected waters. Generally this is easier said than done.

- Where water supplies are contaminated with schistosomiasis, treatment is necessary to remove the schistosomes. Treatment practices such as boiling and chlorination will kill the parasites in the water.

- Where water supplies are provided, measures should be taken to ensure that the water does not become infected. Wells should be properly constructed, cased, capped and sealed from surface run-off. Springs should be well-capped and latrines should be built down hill from water sources and at least 15m away.

Where irrigation is used, the following procedures to limit and control snails are very important in controlling schistosomiasis.

- Eliminate standing water where snails can breed. Level the land to make irrigation more effective and reduce the chances of water forming pools. Standing water can also be channeled into a single pond which can be treated with chemicals to destroy snails. Small depressions where water can collect should be filled in.

- Build adequate drainage facilities. Either open ditch drainage or underground tile drains can be used. Underground drains are better for controlling the spread of disease, but are not generally possible for rural communities because of their cost. Open drains invite snail breeding, but control through spraying is possible. Open ditches which can be chemically treated are preferable to many small stagnant pools or wet areas that breed snails and cannot be treated. Good drainage also improves crop yields.

- Clean weeds and vegetation from streams and irrigation ditches. Snails cling to vegetation and breed.

- Provide for increased water flow when designing canals or line canals with concrete to increase the flow in them. Snails cannot attach themselves to canal walls when the velocity of water exceeds 0.3m/second.

- Provide a system for raising and lowering the water level in canals. When the water level falls, many snails are stranded on the sides of the canal. Many will die or be eaten by predators.

- Do not use small reservoirs to store irrigation water overnight. These reservoirs quickly become breeding grounds for snails and thus for schistosomiasis. If overnight storage is necessary, use a large reservoir and make sure it is drained completely each day.

- During high snail breeding times, plant crops do not require large amounts of water. Attempt to identify that period of time or season when the snail population seems to be the greatest.

These control measures are very important in stopping the spread of disease. They should complement a well-organized public education program stressing health and improved irrigation practices. People must be educated about the problem and definite steps must be taken to solve it. Control methods must be adapted to meet individual situations. They must therefore be selected carefully for each particular case and sometimes for each separate site in order to obtain optimum results for the least cost.

From an operational viewpoint there are two essential objectives:

(1) Control of transmission, usually attempted through snail control, provision of satisfactory sanitary facilities and water supply, and health education.

(2) Control of disease and a marked reduction of prevalence of human infection. This may be achieved through chemotherapy.

(From: Water for the World: Technical Note No. Dis. 2.M.1)

If one of the endemic diseases discussed is malaria, you may choose to give to the participant/lecturer the following table which displays the single dose presumptive treatment for malaria with chloroquine by patients age and weight in areas but areas that are and are not chloroquine resistant areas.

This sheet is provided purely for informational purposes, the participants should not be encouraged to prescribe treatment.

SINGLE DOSE PRESUMPTIVE TREATMENT OF MALARIA WITH CHLOROQUINE

BY PATIENT'S AGE AND WEIGHT

150 MG BASE/TABLET DOSE TABLE

AGE GROUP	WEIGHT RANGE (KGM)	NUMBER OF TABLETS*	RANGE OF MG BASE PER KGM
Under 6 months	3.4 - 7.4	1/2	10-22
6-11 months	7.5 - 9.9	3/4	11-15
1-3 years	10.0 - 14.4	1	10-15
4-6 years	14.5 - 18.4	1 1/2	12-15
7-11 years	18.5 - 34.9	2 1/2	11-20
12-15 years	35.0 - 59.9	4	10-17
16 years and over	60.0 and over	4	Varies

100 MG BASE/TABLET DOSE TABLE

AGE GROUP	WEIGHT RANGE (KGM)	NUMBER OF TABLETS*	RANGE OF MG BASE PER KGM
Under 6 months	3.4 - 7.4	3/4	10-22
6-11 months	7.5 - 9.9	1	10-13
1-3 years	10.0 - 14.4	1 1/2	10-15
4-6 years	14.5 - 18.4	2	11-14
7-11 years	18.5 - 34.9	3 1/2	10-19
12-15 years	35.0 - 59.9	6	10-17
16 years and older	60.0 and over	6	Varies

*Chloroquine is sometimes available as a syrup. Syrups usually contain 50 mg base of chloroquine per 5 ml (about 1 teaspoonful).

CHLOROQUINE RESISTANT AREAS:

PRESUMPTIVE TREATMENT OF MALARIA WITH CHLOROQUINE

BY PATIENT'S AGE AND WEIGHT

150 MG BASE/TABLET DOSE TABLE

AGE GROUP	WEIGHT RANGE (KGM)	DAY 1 NUMBER OF TABLETS*	DAY 2 NUMBER OF TABLETS	DAY 3 NUMBER OF TABLETS	TOTAL TABLETS
Under 6 months	3.4 - 7.4	1/2	1/2	1/4	1 1/4
6-11 months	7.5 - 9.9	3/4	3/4	1/4	1 3/4
1-3 years	10.0 - 14.4	1	1	1/2	2 1/2
4-6 years	14.5 - 18.4	1 1/2	1 1/2	3/4	3 3/4
7-11 years	18.5 - 34.9	2 1/2	2 1/2	1	6
12-15 years	35.0 - 59.9	4	4	2	10
16 years and over	60.0 and over	4	4	2	10

100 MG BASE/TABLET DOSE TABLE

AGE GROUP	WEIGHT RANGE (KGM)	DAY 1 NUMBER OF TABLETS*	DAY 2 NUMBER OF TABLETS	DAY 3 NUMBER OF TABLETS	TOTAL TABLETS
Under 6 months	3.4 - 7.4	3/4	3/4	1/4	1 3/4
6-11 months	7.5 - 9.9	1	1	1/2	2 1/2
1-3 years	10.0 - 14.4	1 1/2	1 1/2	1/2	3 1/2
4-6 years	14.5 - 18.4	2	2	1	5
7-11 years	18.5 - 34.9	3 1/2	3 1/2	1 1/2	8 1/2
12-15 years	35.0 - 59.9	6	6	3	15
16 years and older	60.0 and over	6	6	3	15

*Chloroquine is sometimes available as a syrup. Syrup usually contain 50 mg base of chloroquine per 5 ml (about 1 teaspoonful). Ten to 20 mg per kg of body weight is a safe range for chloroquine.

(Source: CDC/CCCD Draft Training Materials, Delivery of Services: Malaria, pg. 8-9)

Problem Story

In a poor village lived a family with a child named Si Rupa. Si Rupa was such a beautiful and happy child that everyone who passed the house would stop by to look at him. Everyone would say that the child was healthy and strong. Si Rupa's mother and father were very poor, but they were proud to have such a fine child. Si Rupa's mother always wanted her child to stay healthy, but she was sometimes confused about how to take care of her child. She was never sure where to go for advice.

One day during the rainy season Si Rupa seemed ill. He had exhibited the following signs.

- high fever
- chills
- sweats
- vomitting
- diarrhea.

As the days passed, Si Rupa became sicker and sicker. Of course, his mother and father became very worried. The PusKesMas is very far away, and besides it has no doctor. Then one day soon Si Rupa passed away. All of the villagers felt very sad when they took the little boy to be buried, "What made Si Rupa die of malaria, when he had been such a strong and healthy baby?" they asked. A few days later, the villagers had a special meeting. They wanted to discuss why Si Rupa and so many other children in their community died so young. At the meeting, they decided to work together to discover the causes of their problem and to find solutions. They wanted their village to be a happy and prosperous place where the children would grow up healthy and strong.

***

Two years later there were many changes in the village. It was cleaner and the houses and streets had improved very much. Children are given malaria prophylaxis. The people are proud that their children are healthy and do not die the way Si Rupa did two years before.

(Adapted from: Bridging the Gap)

Session 42

IMPROVING HEALTH THROUGH SAFE WATER AND A CLEANER COMMUNITY

TIME TIME 4 hours

OVERVIEW Basic sanitation, with an adequate supply of safe water, is one of the eight components in primary health care discussed in Session 5 (Primary Health Care). Participants have already discussed some specific diseases spread by unsafe water, poor sanitation and poor hygiene in Session 41 (Treatment, Prevention and Control of Selected Endemic Diseases). This session focuses on ways to improve water, sanitation and hygiene to prevent these and other diseases. Participants apply skills and knowledge from earlier sessions to: observe sanitation and hygiene in the local community, discuss ways that hygiene and sanitation can prevent diseases, plan sanitation health education sessions and discuss ways to motivate community involvement in water and sanitation activities.

OBJECTIVES

- To explain how hygiene and sanitation prevent the spread of disease.
  (Step 1)
- To plan health education sessions on ways to prevent diseases through safe water, sanitation and hygiene.
  (Steps 2-4)
- To describe ways to motivate community involvement in water and sanitation projects.
  (Steps 5, 6)

RESOURCES

- Personal Health Training Manual (Peace Corps) pp. 21-43
- Water/Sanitation Case Studies and Analyses (Peace Corps)
- Where There Is No Doctor. Chapter 12, pp.131-145.
- Helping Health Workers Learn. Chapter 5, pp.7-9; Chapter 7, p. 11; Chapter 24.
- Water Treatment and Sanitation: Simple Methods of Treatment for Rural Areas
- Community Culture and Care. pp. 206-210.

Handouts:

- 42A Sanitary Survey Form
- 42B Sanitation, Water Quality and the Spread of Disease
- 42C Methods of Improving Environmental Health Conditions

Trainer Attachments:

- 42A Collecting, Storing and Using Water
- 42B How to Protect a Spring
- 42C How to Build a Latrine
- 42D Taking Care of Your Latrine
- 42E How to Make a Rubbish Pit and How to Make a Compost Pit
- 42F Guidelines for Safe Food
- 42G Role Play Instructions

MATERIALS

Newsprint, markers, locally available visual aids on sanitation

PROCEDURE

Trainer Note

Coordinate this session with sessions in personal health, particularly health maintenance skills.

Prior to this session distribute Handout 42A. Tell participants to look at sanitation conditions in the area around the training site, and ask at least two local people, in the community or on the training center staff, to help them answer the questions on that handout. Tell the participants that they will be using that information for activities in this session. Review the form with the participants to make certain that all the questions are clear. Modify the list to fit local conditions if necessary. Suggest that participants also review what they learned about local sanitation in their community visit earlier in the training program (Session 13, Community Analysis)

Also distribute Handouts 42B and 42C. Ask participants to read them before the session, looking for ideas for sanitation health education for the local community. Suggest that they also look at Helping Health Workers Learn , Chapter 5 Pages 5-9; Chapter 7, page 11 and Where There Is No Doctor, Chapter 12 (Prevention: How to Avoid Many Sicknesses). Tell them about the materials available free from the WASH (Water and Sanitation for Health). Some of these are listed at the back of Water/Sanitation and Case Studies and Analysis (Peace Corps). Water Treatment and Sanitation by H. T. Mann and D. Williams, available from ICE, provides valuable background material on how to carry out water and sanitation measures. Community Culture and Care provides a list of questions to ask to learn about the cultural setting related to sanitation.

Locate some locally available visual aids on sanitation and ask two participants to arrange them in a display prior to the session.

Step 1 (20 min) **Discussing Water/Sanitation and Health**

Introduce the session by showing the display of visual aids on water and sanitation. Briefly review the session objectives and ask what participants have already learned about water, sanitation, and disease in previous sessions. Ask a few participants to share what they learned about water and sanitation when they did the sanitation survey in the community. Make a list of the conditions that they found. Some discussion questions to use are:

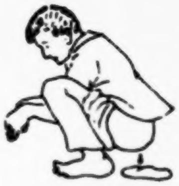
- Which situations promote transmission of disease? How?
- Are people aware that these conditions or practices cause the spread of diseases?
- How could you explain that unsafe water and poor sanitation spread disease, in terms that people in the community could easily understand?

Trainer Note

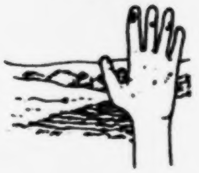
The following problem situations should come out of the discussion: drinking water contaminated by animals, human waste, and laundry; garbage dumped on the ground; food unprotected from flies and rodents; people defecating on the ground; latrines left unclean; hands not washed before cooking, eating or feeding infants.

Make certain that participants have a good understanding of the transmission of diseases so that they can explain this in simple terms. An example of one simple way to illustrate the spread of diseases carried by feces is shown below:

feces carrying
disease

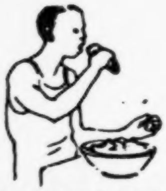


hands
food
water



Worker exposed to contaminated soil

mouth



Does not wash hands before eating

You may want to refer back to sessions on immunizable diseases, diarrhea and other specific endemic diseases for additional examples of disease transmission. prevention and control. Also bring in some of the questions from Community Culture and Care, pp. 206-210.

Step 2 (35 min)

Planning Health Education on Sanitation

Divide participants into six small groups. Explain that they will be listing examples of health education activities they could use to improve the situations they just described. The target group for the activities is the local community. Ask them to note when and how they will involve community members in these activities, what results they expect, and what two activities are highest priority. Tell them that they will be exchanging their plans with another group for review and suggestions, after 30 minutes.

Have the groups choose (or draw from a hat) one problem situation from those listed earlier.

Trainer Note

Have participants recall and apply what they learned in Session 14 (Working With the Community) and Session 21 (Planning Health Education Projects). Suggest that they refer to the handouts that they read before the session: Handouts 42B (Water Sanitation and Disease), 42C (Methods for Improving Environmental Health Conditions), 42D (Community Participation in Planning Water Supply and Sanitation Programs) Helping Health Workers Learn, and Chapter 12 in Where There Is No Doctor as well as the sanitation survey that they did. Give each group the Trainer Attachments 42 A-F related to their problem situation (Collecting, Storing and Using Water, How to Protect a Spring, How to Build a Latrine, How to Care for a Latrine, How to Dig a Garbage Pit, How to Dig a Compost Pit, Guidelines for Safe Food). Ask them to incorporate this information in their plan and report to the large group. Also encourage them to consider using the sanitation visual aids in the display.

Step 3 (20 min)

Exchanging and Assessing Plans

Have each group exchange their health education plan with another group. Ask the groups to review the plans they just received, looking at possible constraints that the health worker might encounter in carrying out the suggested intervention. Instruct them to write these obstacles on newsprint and briefly discuss their conclusions with the group that wrote the plan.

Trainer Note

Tell them to use the same approach to analysis of obstacles that they used in Session 20 (Writing Objectives for Health Education).

Step 4
(45 min)

Group Sharing of Proposed Interventions

Reconvene the large group and have each group briefly summarize their assigned problem situation, proposed intervention activities and difficulties they might encounter in carrying out the activities. Post their planning sheets and facilitate a discussion around questions such as:

- Which activities will be easiest to carry out?
- Which will be most difficult? Why?
- Will most of the proposed activities be effective in improving sanitation? Which won't? Why or why not?
- Are there similarities in the obstacles identified for different activities?
- Are there additional obstacles that we should consider?
- How can we overcome these obstacles?

Step 5
(50 min)

Role Play on Involving the Community in Sanitation Projects

Explain that they will use a role play to look at ways to overcome some of the difficulties just discussed.

Introduce the role play following the instructions in Trainer Attachment 42G (Role Play Instructions). Divide the group into three teams: A team to represent the PCV, a team to represent the villagers and a team of observers. Give each of them a description of their roles and 25 minutes to review instructions and prepare for the role play.

Have the teams enact the role play using one "time out" as described in Trainer Attachment 42G to confer with their advisors.

Step 6
(40 min)

Processing The Role Play

At the end of the role play, facilitate a discussion using the following questions:

Directed at the PC Health Worker Team:
- What were you feeling as the PC health worker? Did your strategy work?
- What would you have done differently or would have liked to change?

Directed at Village Team:
- How did it feel to be the villagers? Were you able to "get into" the role? Why? Why not?
- What impressed you about the PC health worker's approach?

Directed at Observers:
- What role did you see the PC health worker playing? Was he or she a role model?
- Do you think it was appropriate?
- What else did you observe?

Open the session up to general discussion. Focus on questions such as:

- From your discussion of difficulties/constraints and the role play, what factors may affect the acceptance of good health practices?
- How can you indicate community involvement in promoting safer water and a cleaner community?
- In what ways can you make the most of opportunities and skills to serve as role models for good health practices?
- How does cultural understanding and sensitivity enter into the picture?
- How necessary and useful are interpersonal skills in promoting sanitation/hygiene?
- Can you identify any other knowledge, skills or attitudes which would help the PC health worker promote sanitation and hygiene?

Step 7
(10 min)

Session Wrap Up

Wrap-up the session by asking participants to reflect on the session and determine what was significant for them. Have them summarize the major points that emerged and then complete the following statement.

The most important thing I learned from this session is . . .

It will help me in the field because. . .

Have individual participants share their thoughts with the larger group.

Trainer Note

Encourage participants to continue learning vocabulary related to water and sanitation in which they will be working and more about cultural beliefs and practices affecting water and sanitation. Because most sanitation efforts require a considerable amount of time, there is little practice in sanitation and water improvement in this session other than health education planning. Since Volunteers need many of these skills in the fields, it is important to arrange opportunities during training for them to properly carry out the following:

- Locate, build and take turns in maintenance of a latrine.
- Examine water sources and where possible take measures to protect them.
- Dig garbage and compost pits.

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SANITARY SURVEY FORM

Village ______________________ Number of Houses/Compounds ______________

District ______________________ Estimated Population ______________

Village Leader ______________________ Is there a Health Committee? ______________

Village Health Representative ______________________ Who is its leader? ______________

Is there a health education program for the village? ______________________________

If yes, describe

Waste Disposal:

Number of houses/compounds with no excreta disposal facilities ______________

Number of houses/compounds with excreta disposal facilities ______________

Describe types of excreta disposal facilities ______________

Are existing excreta disposal facilities a health hazard? If so why?

Are latrines individual or communal?

Are houses spread out sufficiently to site latrines?

What is the water level during the dry and wet season?

What type of soil is there in the village (i.e. sandy, clay, rocky)?

Where and in what manner are garbage and trash disposed?

Are garbage and trash a problem? Why?

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SANITARY SURVEY FORM (Cont'd.)

Indicators:

Are rats and other rodents a problem in the area?

Are flies, cockroaches, and other insects a problem?

Other observations:

Resource availability and unit costs:

	Availability			Availability	
	Yes/No	Unit Cost		Yes/No	Unit Cost
Contractors			Cement		/sack
Skilled labor		/hr	Lumber		/meter sq.
Unskilled labor		/hr	Native materials		
Sand		/	Bamboo, trees		
Gravel		/	Brick		/each
			Re-bar		/each

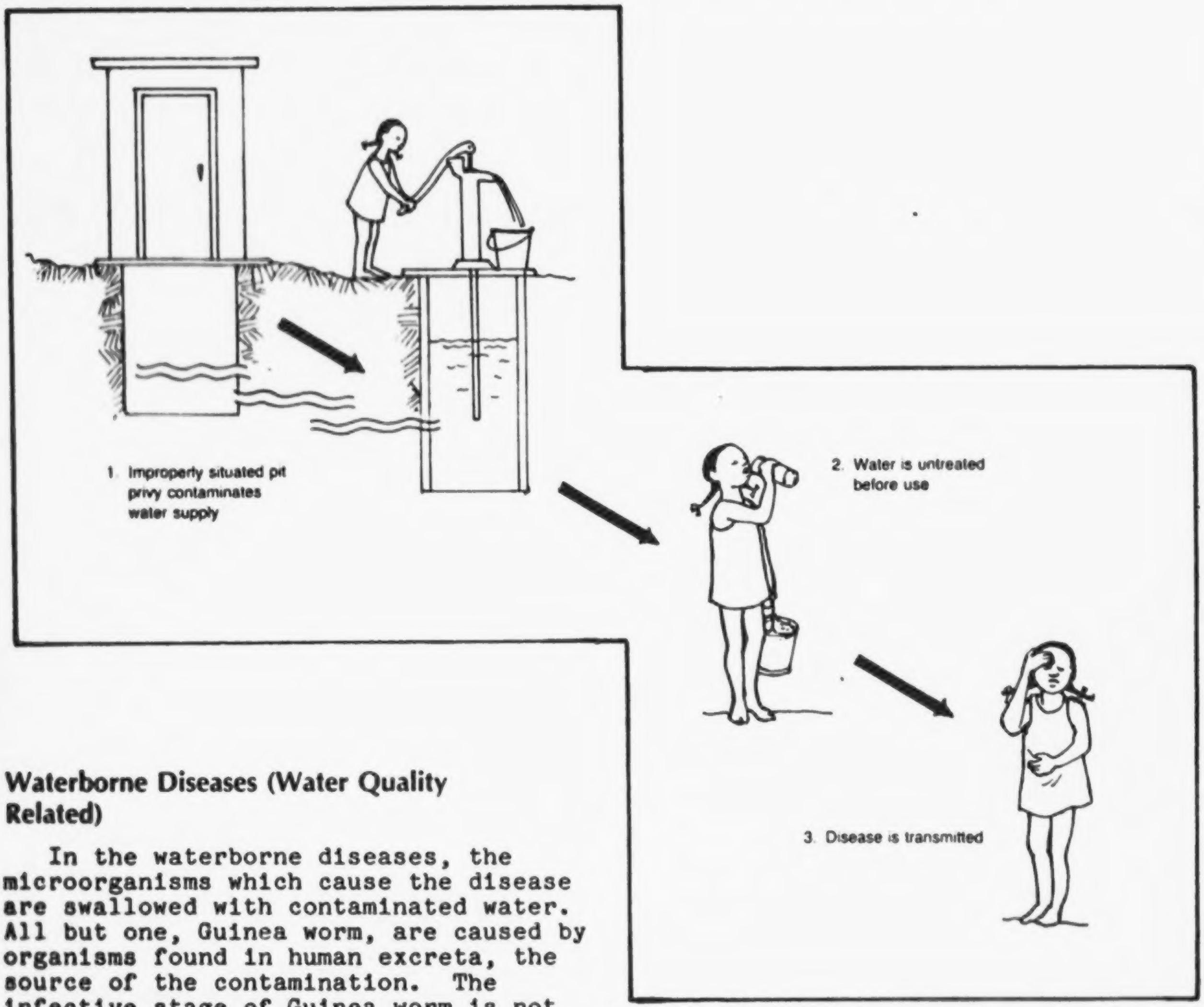
Additional Comments/Observations

Sanitary Survey Form (Cont'd.)

Water sources locate on map	Protected from contamination yes/no	Water quality taste, odor, color, turbidity	How is water obtained? Bucket, pump etc.	Communal or private source	What season is this source used? Dry/wet	Distance of source from user's homes	COMMENTS
Wells							
Springs							
Streams							
Ponds							
Other							

(From: WASH. A Workshop Design for Latrine Construction. PP. 16-18)

SANITATION, WATER QUALITY AND THE SPREAD OF DISEASE


1. Improperly situated pit privy contaminates water supply
2. Water is untreated before use
3. Disease is transmitted

Waterborne Diseases (Water Quality Related)

In the waterborne diseases, the microorganisms which cause the disease are swallowed with contaminated water. All but one, Guinea worm, are caused by organisms found in human excreta, the source of the contamination. The infective stage of Guinea worm is not from fecal contamination, but is from a tiny larva that develops in a water-flea after the larva is discharged into the water. The larva comes from a blister on the skin of a person infected with the meter-long adult worm.

Cholera and typhoid fever are the waterborne diseases which are most feared because, when untreated, they have high death rates. However, the diarrheas and dysenteries are more important because of the infant death and huge numbers of illnesses they cause. In the developing countries, the diarrheas and dysenteries cause hundreds of millions of illnesses and millions of infant deaths each year.

The basic transmission of waterborne disease is person to person. The microorganisms for infected people contaminate water which is consumed by other people. Figure 1 shows a common way that water becomes contaminated. The contamination of water supplies occurs:

1. Where latrines and privies are located uphill from or very close to a water source such as a spring, stream, pond or well. Liquids carrying the organisms seep from the latrines into the water supply.

2. Where privy pits, soakage pits, or sewage absorption systems penetrate the water table of an aquifer located near the surface and shallow wells and springs whose water comes from the aquifer are contaminated.

3. Where wells and springs are unprotected so that surface run-off enters these water sources. The run-off after rainfall carries disease-causing organisms into the water source.

4. Where sanitation is poor. If people defecate on the ground or in bodies of water rather than in safe latrines or privies, disease-causing organisms can get into water supplies.

5. Where Guinea worm occurs, water is contaminated when the skin of an infected person with a blister caused by the worm is immersed in water and great numbers of larvae are released into the water. Some of the larvae are eaten by tiny water fleas (Cyclops). The larvae in the water fleas grow, shed their skins, and become infective. When a water flea containing an infective larva is drunk with water from the contaminated source, the little worm is transmitted to a new person where it grows to maturity under the skin.

Water-Washed Diseases (Water Quantity and Accessibility Related)

Water-washed diseases are diseases whose transmission results from a lack of sufficient clean water for frequent bathing, hand washing before meals and after going to the toilet, and for washing clothes and household utensils. Several common diseases fall into this category. Shilgellosis (bacillary dysentery), salmonellosis (food poisoning), trachoma, and scabies are all diseases that can be passed by direct contact between people or by the direct contamination of food by dirty hands or flies. Figure 2 shows one way water-washed diseases are spread. The diseases in this group are transmitted:

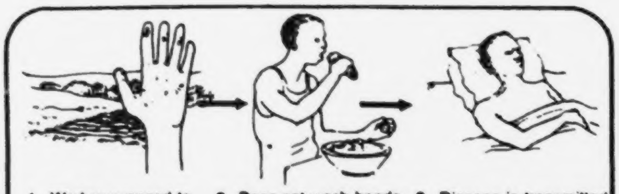

1. Worker exposed to contaminated soil 2. Does not wash hands before eating 3. Disease is transmitted

Figure 2. Transmission of Water-Washed Diseases

1. When a water supply produces insufficient quantities to meet peoples' needs or when the water supply is located at a distance from the users. The availability of only small amounts of water makes the practice of good personal and household hygiene difficult, or even impossible.

2. When feces are not disposed of in a sanitary way. Uncovered or unprotected latrines or stools passed on the ground are breeding places for flies and sources of bacteria. Bacteria and viruses are passed from feces to people by flies, contaminated fingers and food. Food contamination with salmonella quickly grows great numbers of the bacteria. When eaten, the food causes food-poisoning diarrhea with life-threatening consequences, especially for small children.

3. When people are ignorant of the need for personal hygiene and, for whatever set of reasons, either do not bathe frequently or use the same water and towels to wash more than one person, then trachoma and conjunctivitis are passed around within a family or other groups living together and scabies get passed from the skin of one person to the skin of another.

Sanitation-Related Diseases (Fecal Polluted Soil Related)

Sanitation-related diseases are specifically those that are transmitted by people lacking both sanitary facilities for waste disposal and knowledge of the need to dispose of wastes in a sanitary manner. The infective stage of the worm which causes those diseases develops in fecally contaminated soil. The most common diseases in this category are hookworm and roundworm.

Hookworm larvae develop and live in damp soil that has been contaminated with feces containing hookworm eggs. They penetrate the bare feet of people walking or standing on the infected soil. See Figure 5. Entrance can also occur through the hands or other skin areas.

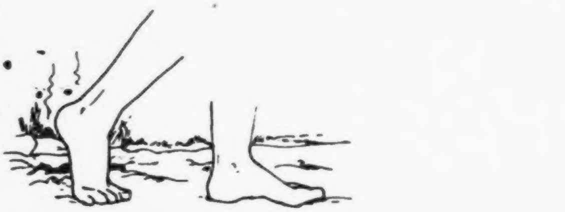
Roundworm or ascariasis is transmitted by swallowing eggs which have become infective by developing on polluted soil. The eggs are eaten by children who play on the infected soil, drop food on the soil and then eat it, or eat from dirty hands or eat contaminated raw vegetables.

Both diseases occur:

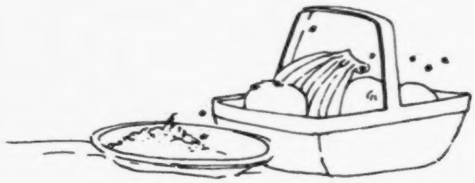
1. Where there are not latrines and the soil is polluted, where latrines are not sanitary or where they are not used.

2. Where fresh untreated feces are used as fertilizer.

3. Where people are not educated to wash their hands before eating.



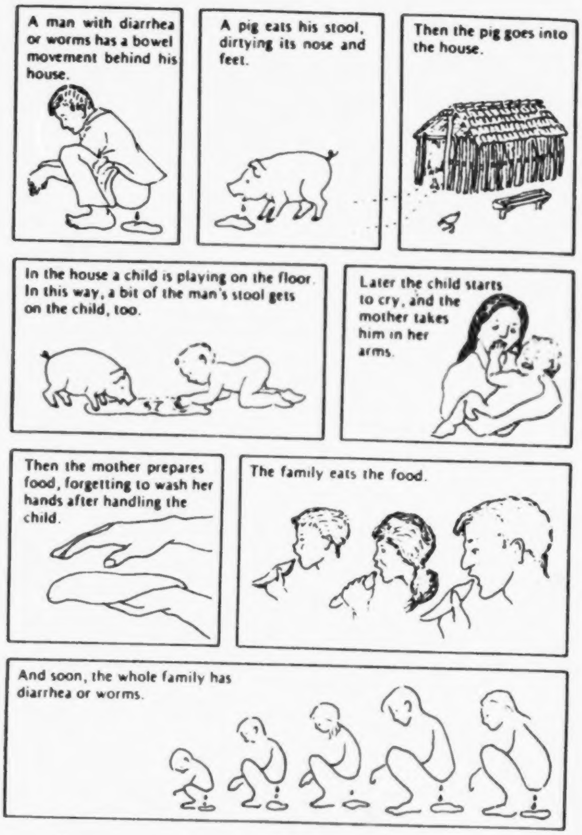
a. Hookworm is transmitted through the feet of people walking barefoot in contaminated soil



b. Roundworm is often transmitted by contaminated flies which land on food

Figure 5. Transmission of Sanitation-Related Diseases

Many times pigs, dogs, chickens, and other animals spread intestinal disease and worm eggs. For example


A man with diarrhea or worms has a bowel movement behind his house.
A pig eats his stool, dirtying its nose and feet.
Then the pig goes into the house.
In the house a child is playing on the floor. In this way, a bit of the man's stool gets on the child, too.
Later the child starts to cry, and the mother takes him in her arms.
Then the mother prepares food, forgetting to wash her hands after handling the child.
The family eats the food.
And soon, the whole family has diarrhea or worms.

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(From: AID. " Water for the World Technical Note" No.DIS.1 M.1.)

Water for the World

Methods of Improving Environmental Health Conditions

Technical Note No. DIS. 1.M.2

The improvement of people's health may require that certain changes be made in the environment. Local conditions which contribute to the transmission of disease must be changed or eliminated. Water supplies have to be protected, improved or treated. Methods for the sanitary disposal of wastes must be used, insect vectors must be controlled, destroyed or guarded against, and educational programs must be instituted to make people aware of the need to prevent disease and teach them how to do so.

In the technical note, "Means of Disease Transmission," DIS.1.M.1, several categories of diseases were outlined and the specific mode of transmission of each was discussed. This technical note describes measures that can be taken to prevent the spread of water- and sanitation-related diseases.

Useful Definitions

HABITAT - A region or area where a plant or animal grows, lives or is ordinarily found.

SPILLWAY - A channel built to control the level of water in a dam reservoir; flood water is drained from a dam through spillways.

VECTOR - An animal or insect that transmits a disease-producing organism from one host to another.

Waterborne Diseases (Water Quality Related)

Waterborne diseases are those which are spread when the microorganisms causing them are consumed with contaminated water. Several methods of preventing water contamination and for improving the quality of water can be used. The need to biologically test the water for evidence of fecal contamination is of great importance. Water can be tested by collecting samples and taking them to a central laboratory or by performing tests in the field using special kits. (These methods are discussed in "Taking a Water Sample," RWS.3.P.2 and "Analyzing a Water Sample," RWS.3.P.3.)

In some locations, there may not be a way to test water because of long distance to testing laboratories and lack of field equipment. If testing is impossible, the assumption that the water is contaminated should be made if conditions at the water site are such that the source is not fully protected. Furthermore, measures to improve those conditions and prevent the spread of disease should be assumed to be needed. The following measures are important for improving local environmental conditions.

- Make sure that people have and use sanitary latrines. The community members should be educated about the need for latrines and how their use can reduce the spread of serious disease.
- Educate the people in where to locate latrines and how to construct them properly. All latrines should be located at least 15m from the nearest source of water. They should be at a lower elevation than the water source to ensure that contamination through seepage is prevented. See Figure 1.

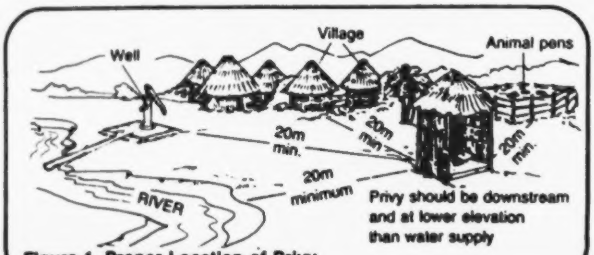

Village
Well
Animal pens
20m min.
20m min.
20m min.
20m minimum
RIVER
Privy should be downstream and at lower elevation than water supply

Figure 1. Proper Location of Privy

- Be sure that the pit does not puncture an aquifer. Latrine seepage that enters an aquifer can contaminate ground water (wells) and spring water supplies.

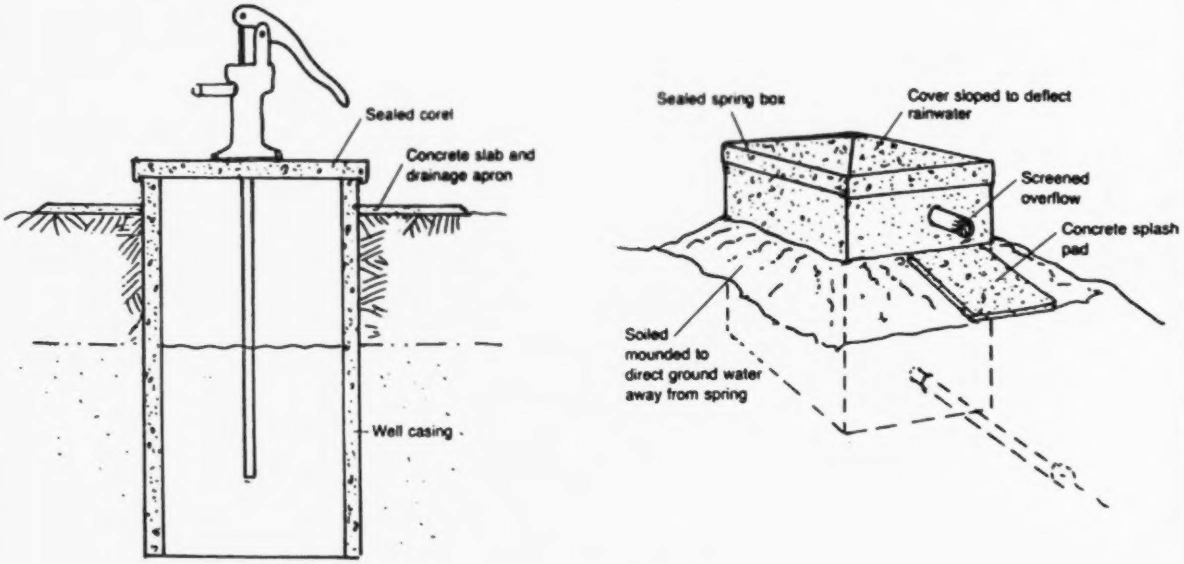
- Protect all wells and springs against contamination from surface run-off. Cap springs with spring boxes. Finish wells with a well head. Make sure that the well shaft is cased with concrete rings, pipe or brick. No surface water should seep into wells. See Figure 2.

- For surface sources, especially those providing large quantities of water, set up an intake that allows for filtration of water before it enters storage. Filtration may not be sufficient to purify water and some form of treatment may be needed.

- Provide for treatment (further filtration or chlorination, for example) to purify water if needed. For household supplies, water can be boiled or chlorinated and stored in clean containers.

- Control the breeding of flies by disposing of garbage and animal manure in a sanitary manner, and covering latrine openings when not in use. All community garbage should be disposed of in a sanitary landfill, while individual disposal can be achieved by digging small pits where rubbish can be burned and garbage buried. See Figure 3.

To control Guinea worm, eliminate all step-wells where the skin of water carriers can come into contact with the water in the well thereby permitting the release of worm larvae into the water. Treat all water taken from open ponds or wells that might be contaminated with infected water fleas by filtering, chlorinating, or boiling it before drinking. These treatments will kill the larvae before they can infect a person.


Sealed cover
Concrete slab and drainage apron
Well casing
Sealed spring box
Cover sloped to deflect rainwater
Screened overflow
Concrete splash pad
Soiled mounded to direct ground water away from spring

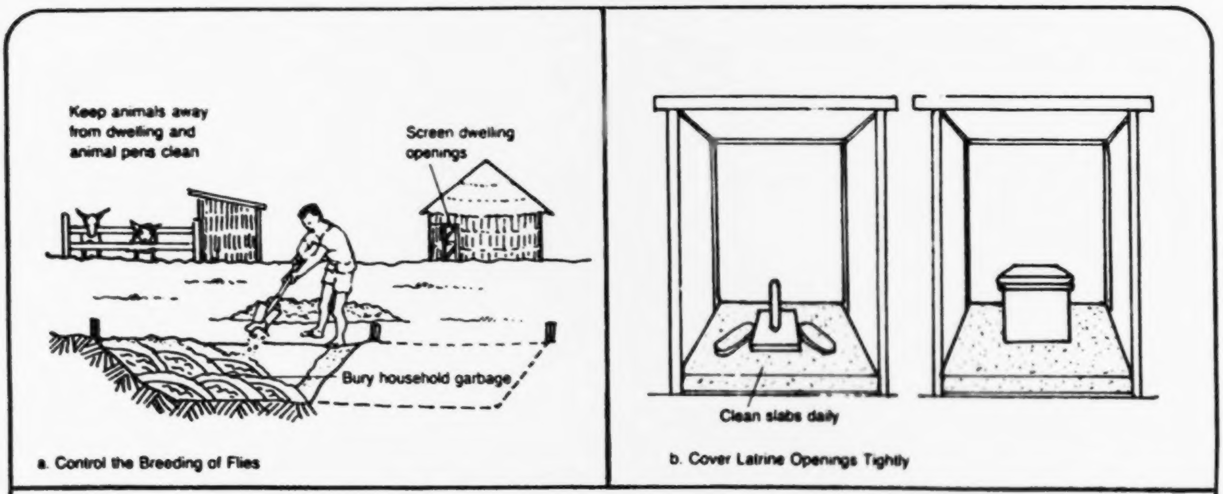
a. Well

b. Spring

Figure 2. Proper Protection of Water Supplies

Water-Washed Diseases (Water Quantity and Accessibility Related)

These diseases are ones which can be prevented by the provision of sufficient quantities of safe water. To



a. Control the Breeding of Flies

b. Cover Latrine Openings Tightly

Figure 3. Proper Disposal of Wastes

prevent the spread of water-washed diseases, people should be educated and motivated to practice personal and family hygiene. Washing of hands and bathing in clean water are very important. Clothes and dishes should also be washed to ensure that skin diseases are not passed to people by contaminated hands, clothing, or utensils. The same wash water should not be used by more than one person. Common use of towels should be avoided.

In order to improve hygiene practices, sufficient, convenient quantities of water are needed. A method of developing a water supply of sufficient quantity, adequate quality and easy accessibility and reliability should be chosen with the involvement of the community. The source should be well-protected to prevent contamination of the water supply.

Water-Contact Diseases (Body-of-Water Related)

Water-contact diseases are those which people get from having skin contact with water containing larval worms. There are both environmental and chemical means for controlling the spread of water-contact diseases.

Schistosomiasis is the major disease in this category. Schistosomiasis is controlled by breaking the chain of transmission at several points. The following measures should be followed when attempting to control the spread of schistosomiasis.

- Encourage people to build sanitary facilities and use them. If the eggs in the feces and urine do not reach water they will die, preventing the infection of the snails. This method is useful but is only truly successful if everyone uses latrines for both urinating and defecating. Assurance that everyone over a large area would use them is impossible. Therefore, this method must be combined with a reduction of the snail population and by limiting human contact with infected waters.

- Reduce the snail population. In irrigation schemes, drainage ditches are better environments for snails than irrigation canals. Where drainage ditches are necessary, they must be treated regularly with chemicals that kill snails. When canals are built, line them with a smooth surface like concrete and provide for a rapid flow rate. Smooth surfaces are not attractive to snails and a fast flow of water removes them.

- Maintain the banks of all irrigation canals and bodies of water. Vegetation slows water flow and provides a good environment for snail growth. Keep vegetation and weeds away from canals and beach areas. See Figure 4.

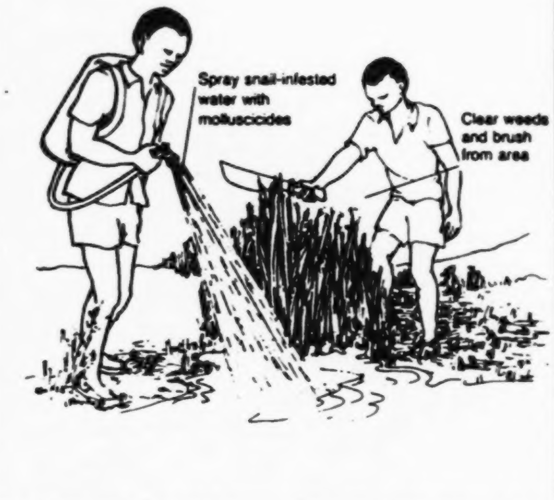

Spray snail-infested water with molluscicides
Clear weeds and brush from area

Figure 4. Chemical and Environmental Control of Schistosomiasis

- Drain large standing pools of water and fill in swampy areas to prevent the snails from breeding. Wherever possible, avoid the creation of small reservoirs or pools of water. These environments are very attractive to snails.

- Use chemicals that kill snails molluscicides. They are quite effective in controlling the snail population. Local spraying is the common method of applying molluscicides to water and is quite successful for irrigation projects. See Figure 4. Aerial spraying has also proved effective in many places. The application of molluscicides is less successful in large bodies of water because the water volume dilutes the molluscicides. Only if a specific local site on a large water body is treated with chemicals will success be achieved.

Swimming, bathing and clothes washing in infected water should be avoided. Whenever possible, houses and settlements should be located away from infected waters. In all settlements, both new and existing, potable, piped water systems should be developed. Safe water should be provided in sufficient quantities for drinking, bathing and washing.

Water-Related Insect Vectors (Water Site Related

Diseases that fall into this category are caused and spread by insects that breed in water or in damp, high humidity environments near water sources. Several measures can be taken to control the populations of mosquitoes, tsetse flies, and blackflies which spread malaria, yellow fever, sleeping sickness (trypanosomiasis) and river blindness (onchocerciasis).

Control of virtually all these diseases involves the elimination of the mosquitoes and flies through environmental or chemical means. Although the application of both aerial and ground spraying of insecticides has proved very effective, there are questions about the environmental effects of using them on a large-scale for a long time. Chemical control is sure to continue, but other methods should also be incorporated into vector control plans.

- Control of the tsetse fly which transmits sleeping sickness can be achieved by changing the environment where flies breed. One method is bush clearing along water courses and around villages. An attempt should be made to use cleared areas for permanent agriculture or settlement and thereby keep the land clean of bush.

- Blackflies, which spread river blindness (onchocerciasis), breed in rapidly flowing rivers. Chemical means are the best control for blackflies but some alternative measures can be developed. When dams are built in fast-flowing streams and rivers, the upstream lakes cover the rapids and destroy the breeding areas of the blackfly. Spillways should be built on the vertical face of the dam to avoid creating a new breeding place for the flies.

Mosquitoes transmit both malaria and yellow fever. The control of these insects is important both on a large-scale and an individual household basis.

Large-scale measures other than spraying chemicals include the draining and filling of wet, swampy places where mosquitoes breed.

Smaller-scale and individual measures should also be taken to control the breeding of mosquitoes. All possible standing water where mosquitoes could breed should be covered. Water storage jars and wells are particularly attractive breeding places for mosquitoes. Standing water in gutters should be removed and gutters should be sloped to remove water. At well sites, do not permit water to pool. Some sort of drainage should be built to move water away from the site and measures should be taken to prevent pools of water from developing. Remove any garbage where pools of water can collect and cover latrines so that mosquitoes cannot breed inside. Figure 5 shows some individual preventive measures.

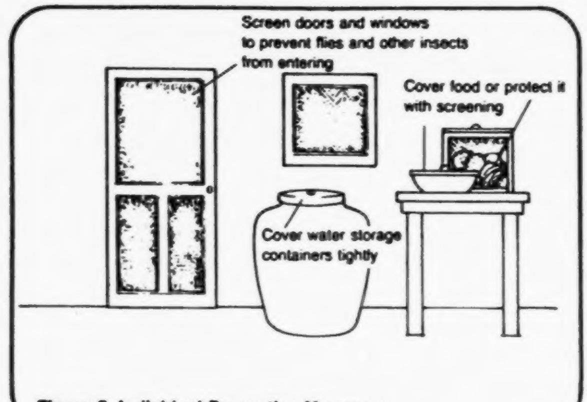

Screen doors and windows to prevent flies and other insects from entering
Cover food or protect it with screening
Cover water storage containers tightly

Figure 5. Individual Preventive Measures

These measures, coupled with spraying and a program of health, education will greatly help reduce the growth of the mosquito population.

Sanitation-Related Diseased (Fecal polluted soil related)

Diseases in this category, such as hookworm and roundworm, are a direct result in fecal pollution of soil and the lack of knowledge about good hygiene practices. These diseases can be controlled by relatively simple environmental improvements.

- Educate people on the need to use latrines and train children to use them at a very early age. Diseases are sure to be spread where human wastes are deposited on the ground or in rivers and streams.

- Make sure that all latrines have covers to prevent insects from breeding in the latrine pit.

- Provide sufficient quantities of water to ensure that people can practice personal hygiene. Make sure that people understand the need to wash their hands before eating and after defecating.

- Develop ways to keep flies off food. Screen areas where food is stored. Spraying the home periodically will keep flies and cockroaches away from food.

- Keep animals from entering the home and from coming into close contact with young children. Feces from animals can also spread disease.

Summary

Methods for controlling the spread of disease range from very simple and inexpensive family-oriented approaches to large-scale, more expensive community, regional and national programs. The choice of method will greatly depend on the circumstances, the problems to be remedied and the resources available. Generally, no single method will prove sufficient and a combination of methods is necessary.

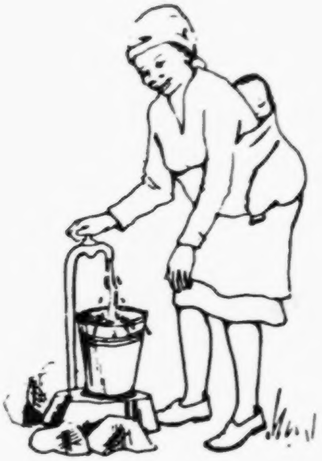
The simplest methods of control are those which can be instituted by the construction of simple water systems and sanitary waste disposal systems. These systems are discussed at length in the technical notes on rural water supply and sanitation. See "How to Use Technical Notes," HR.G, for a full list of technical notes.

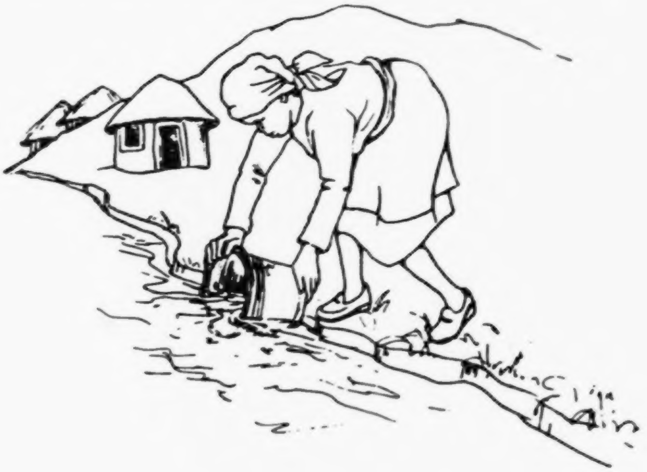
No successful control program can be developed unless people are educated about the need for a system. A thorough health education program must be developed so that people recognize the problem themselves and are stimulated to search for the appropriate solutions. Community participation is discussed in greater detail in the technical notes on human resources.

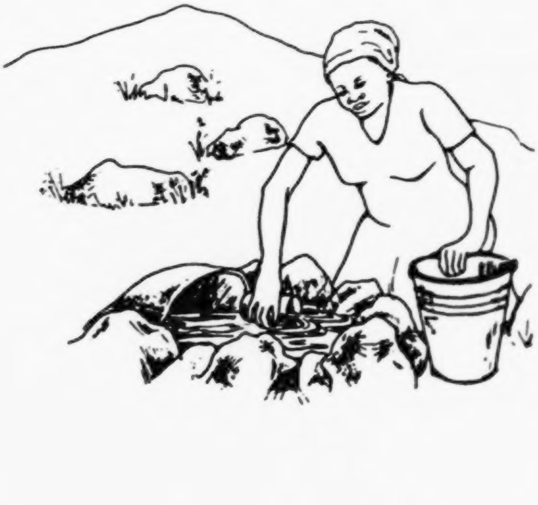
(From: AID. "Water for the World Technical Note". No. DIS. 1 M.2)

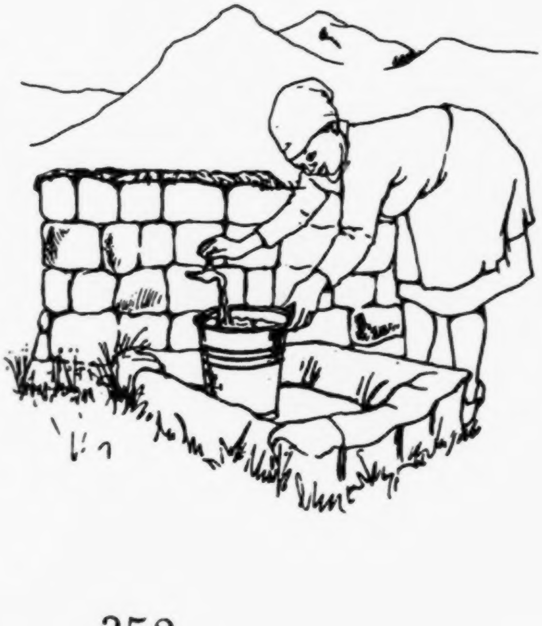
Collecting, Storing, and Using Water

In this session you will learn how water gets dirty. Look at these pictures. These pictures show different places people get water. What sources of water do people use in your community?

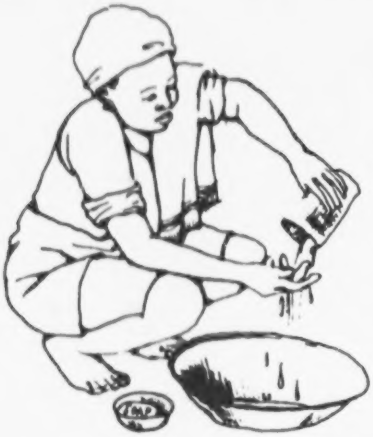




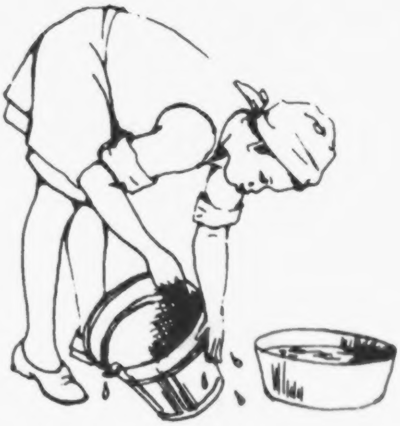




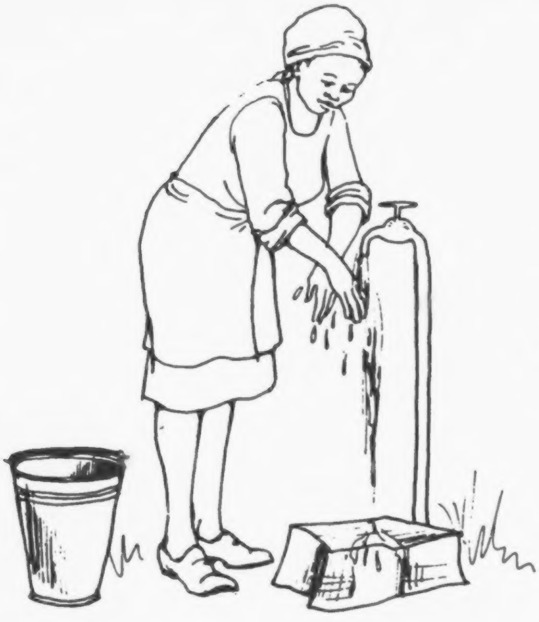
Here are some things that mother can do so her child gets clean water.



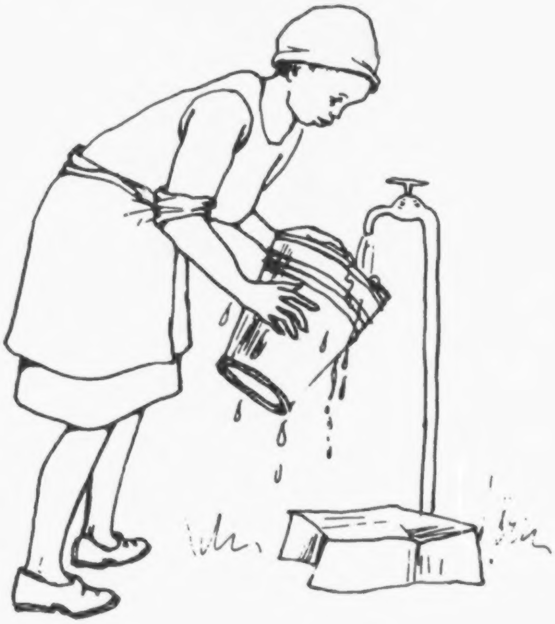
Mother should wash her hands before picking up the bucket.



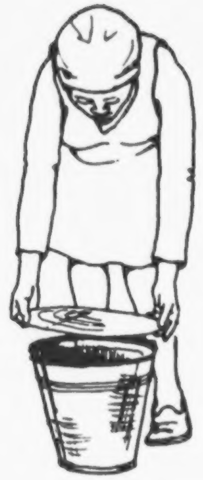
Mother should wash the bucket before collecting the water. Then she will not make the water dirty.



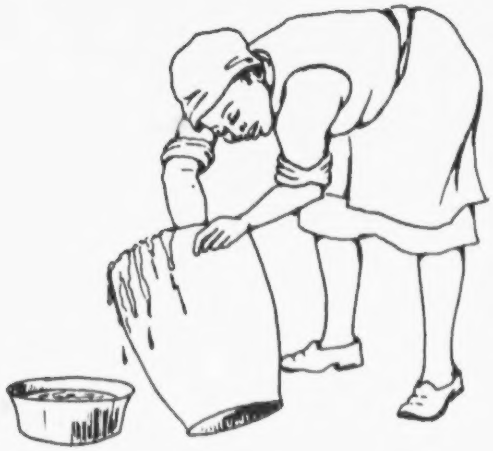
Mother should wash her hands.



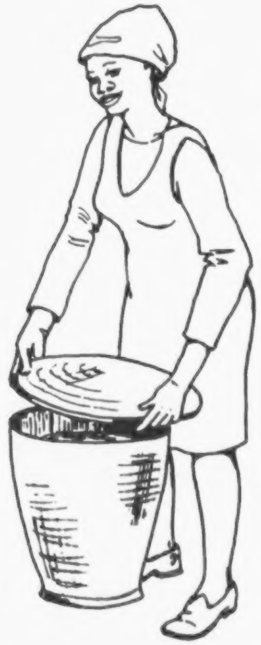
Mother should also wash the bucket before filling it with water.



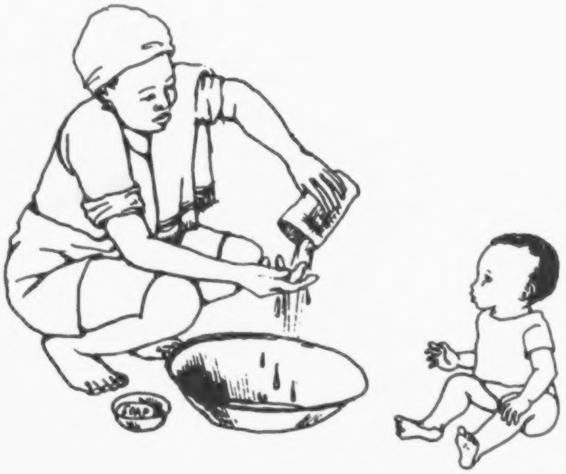
Mother should cover the bucket. Then the water will not get dirty when mother is carrying the water.



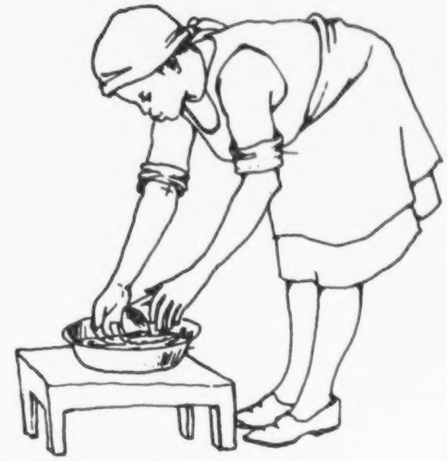
Mother should wash the storage vessel after she gets home. Mother should also wash the scoop she uses to take out the water.



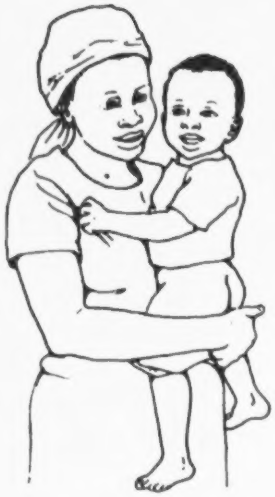
Mother should cover the water to make sure that the water does not get dirty. Mother should also cover the scoop.



Mother should wash her hands before giving the water to her child.



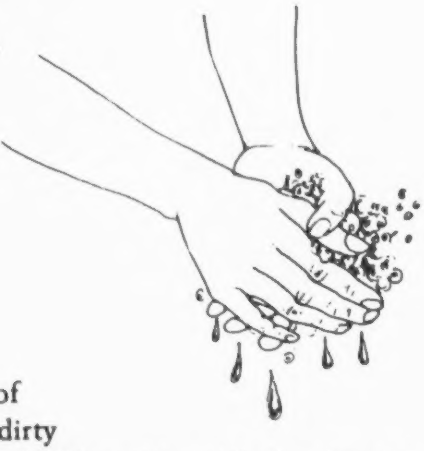
Mother should also wash the cup for her child.



If mother takes such good care, then her child will stay healthy. Her child will not get diarrhea often.

Why Must You Wash Your Hands?

You must wash your hands so that your hands are clean. If you prepare food for your child with clean hands, your child will not get ill.



You can make other members of your family ill by cooking with dirty hands. You can also make yourself ill by eating with dirty hands.

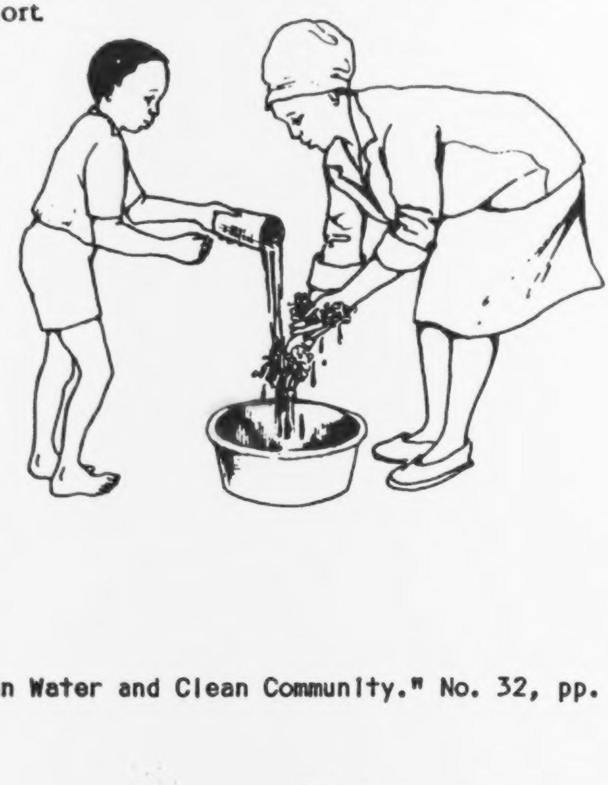
When Should You Wash Your Hands?

You should wash your hands as often as possible. You must always wash your hands with soap and water:

After going to the toilet
After cleaning your child's toilet
Before preparing food
Before feeding your child
Before eating food
Before taking water from the storage vessel

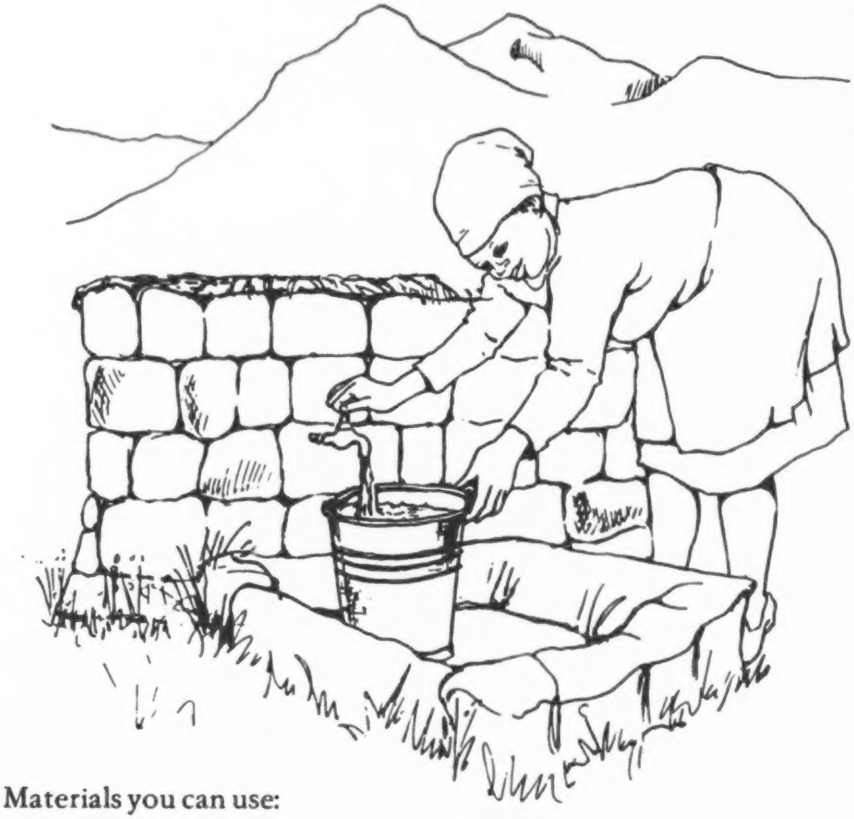
How Should You Wash Your Hands?

You should wash your hands with soap and running water. You can have running water by asking someone to pour water for you. You should wash your hands well with soap. Put soap all over your hands and wrists. Clean your nails well with soap and clean water. Also keep your nails short.



(From: MEDEX. "Clean Water and Clean Community." No. 32, pp. 7-15.)

How to Protect a Spring



Materials you can use:

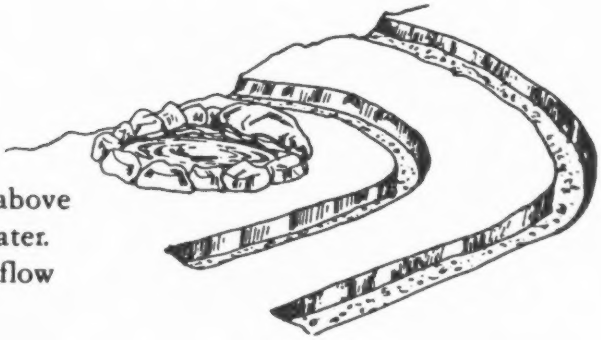
Stones or boulders	Rough and fine sand
Bricks	75 mm PVC or galvanized pipe
Cement	Poles for covering the tank

Protecting the Spring

1. Dig around the source of the water until you reach the rock formation. Dig until you find the eye of the spring.
2. Clean mud, weeds, and other debris from around the eye of the spring.
3. Make mortar from cement, sand, and water.

4. Place stones or bricks with mortar on the rocks around the eye of the spring. Continue building around the eye of the spring until it is covered in a dome.
5. Leave a small opening for a pipe. Place the pipe in the opening. Seal the opening with mortar. Place the pipe about one half meter above the ground so you can collect water from the dome.
6. If you want to also build a tank place the pipe about 50 mm above the ground. This pipe will carry the water into the tank. Cover the pipe with stones and mud so children cannot break the pipe.
7. Build the tank with stones or bricks, and mortar. Build the tank downhill from the spring.
8. Make a cover for the tank with poles, stones, and mortar.
9. Make an outlet from the tank high enough to collect water. Fix a pipe and a tap if necessary. Seal the pipe with mortar. Also make an overflow with a short piece of pipe about 200 mm from the top of the tank.

Rain water can make the spring dirty. You should ask people in the community to keep the area above the spring clean. Fence the area above the spring. Then animals and people will not dirty the area.



You can build two trenches above the spring to stop the rain water. Then the rain water will not flow into the spring.

(From: MEDEX. "Clean Water and Clean Community." No. 32, pp. 19, 33-34.)

How to Build a Latrine

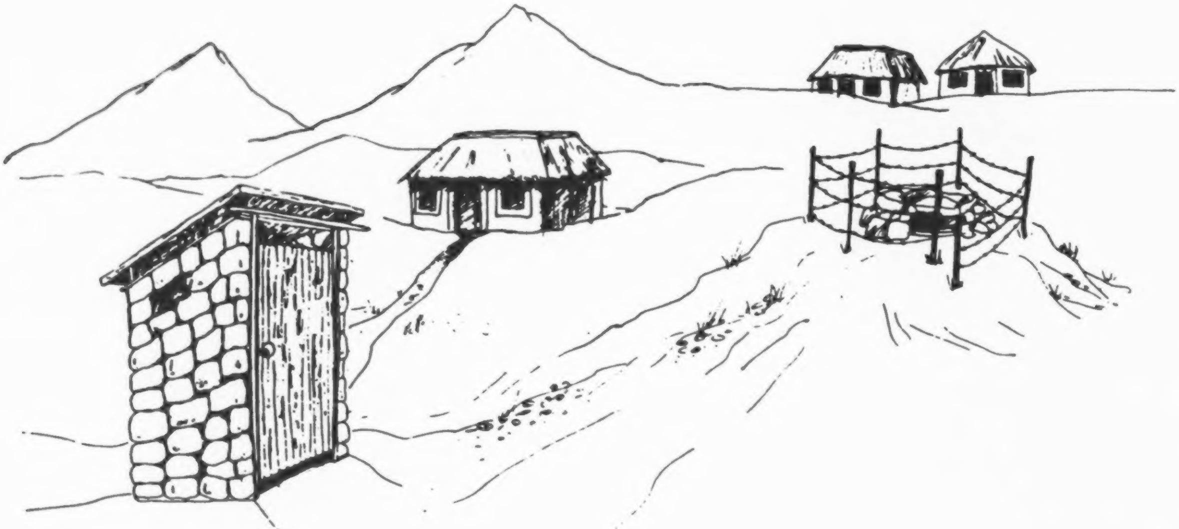
Mapontso Motsapi built her latrine with what she had in her yard. You do not need special things to make a latrine. You can build a latrine with the materials you may have. Here are some simple steps you can take to build your latrine.

1. Finding Materials to Use

   You can use reeds, grass, bricks, stones, mud, cement, split poles, branches, or other materials that are available in your community.

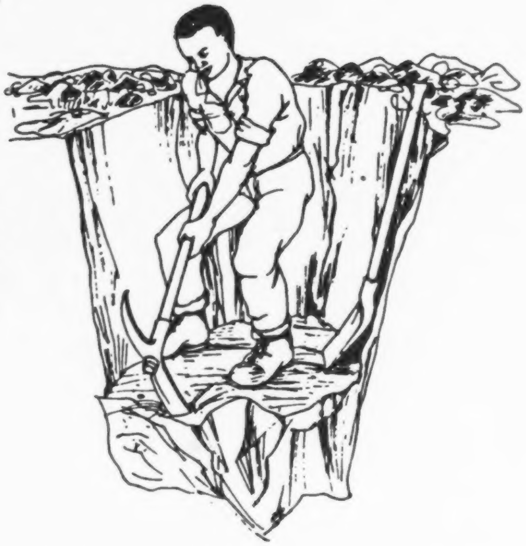
2. Deciding Where to Build Your Latrine

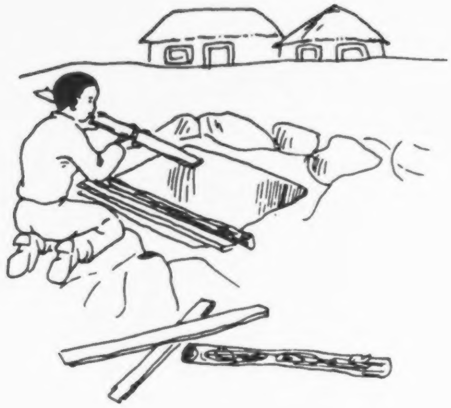
   Build your latrine at least 6 meters from your house. Build your latrine at least 30 meters from any water source. Always build your latrine downhill from the water source.



3. Digging the Pit for Your Latrine

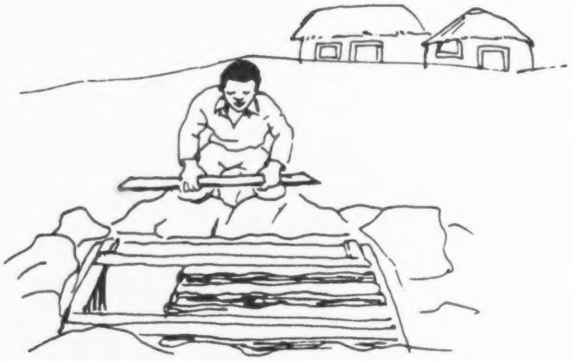
Dig a hole, 1 meter long and 1 meter wide. The hole should be 3 meters deep. Make the hole or the pit smaller at the bottom than the top. The sides of the pit will slant in. Then the pit will not cave in. Line the pit and the sides with stones if the soil is sandy or unstable.





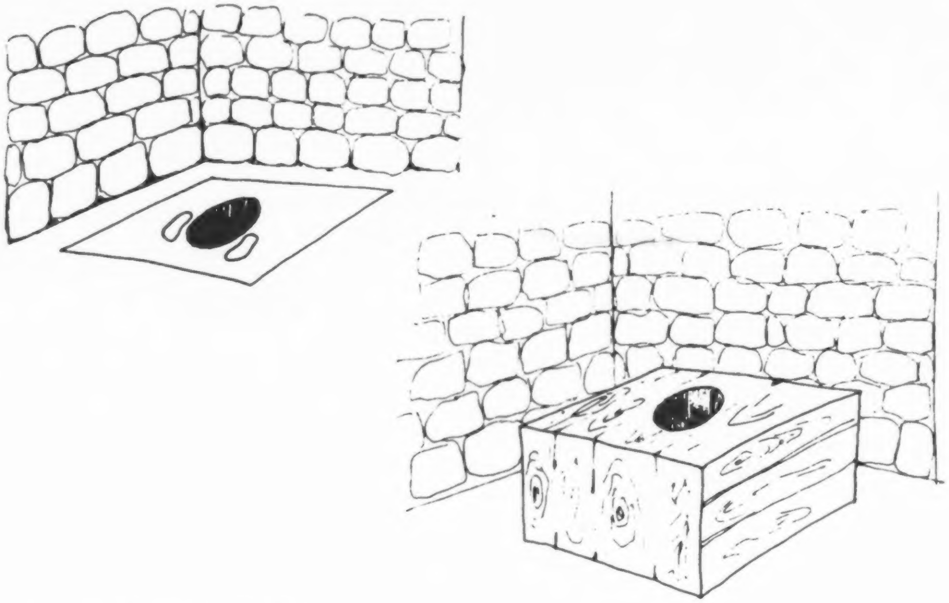
4. Making the Floor

You can make the floor with wood, branches, cement, mud, poles, or other materials that are available in your community. Use the soil you have dug out of the pit to raise the floor of the latrine. Then rain water will not go into the pit. Leave a hole in the middle of the floor and above the pit. Seal the pit with mud, clay, or mortar all around so no light enters the pit.



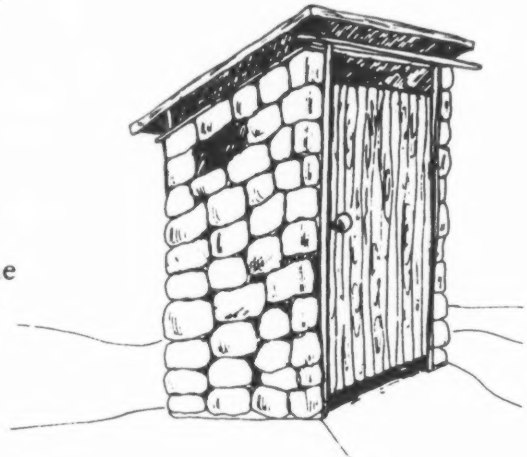
5. Making the Seat or the Squatting Stones

You can make a seat or squatting stones with materials that are available. Remember to make a cover for the hole. Make a long handle for the cover of a squatting latrine.



6. Building the Walls

Make the walls with materials you have. The front wall should be 2 meters high. The back wall should be a little shorter. The roof of the latrine will slant down from the front to the back.

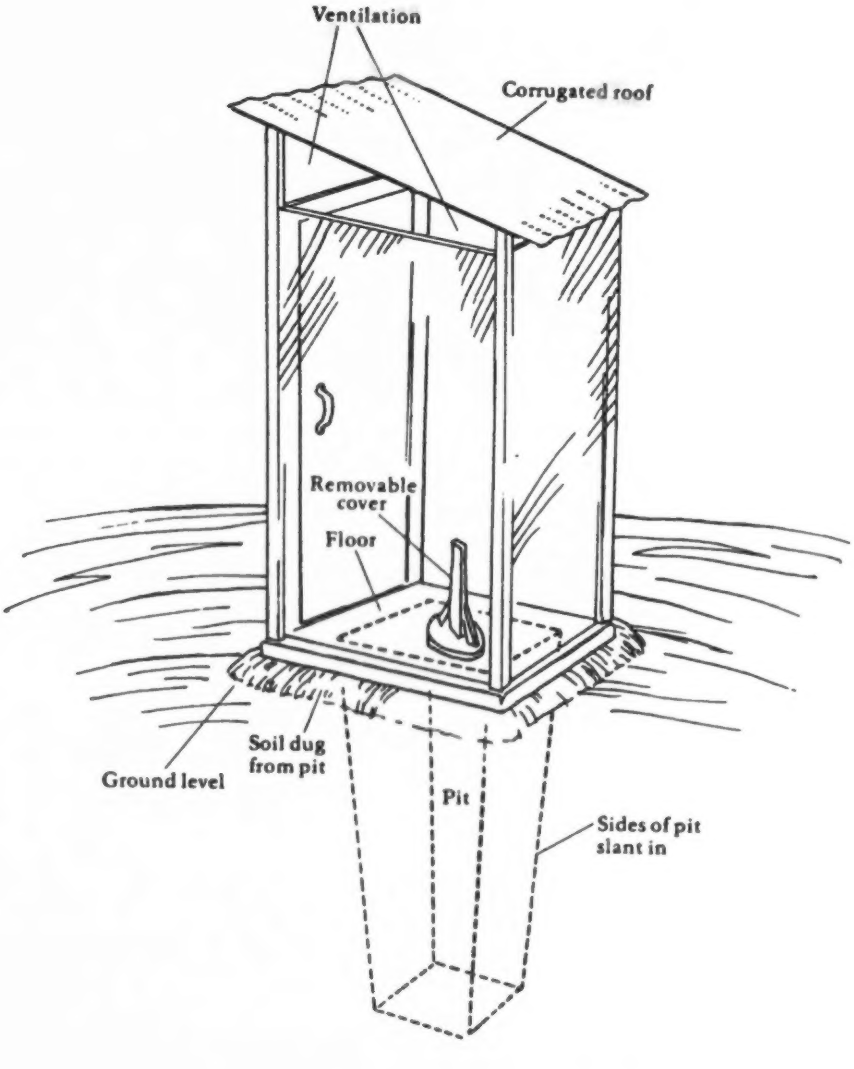


7. Ventilating the Latrine

Leave an opening between the walls and the roof for ventilation. This will help make the latrine less smelly.

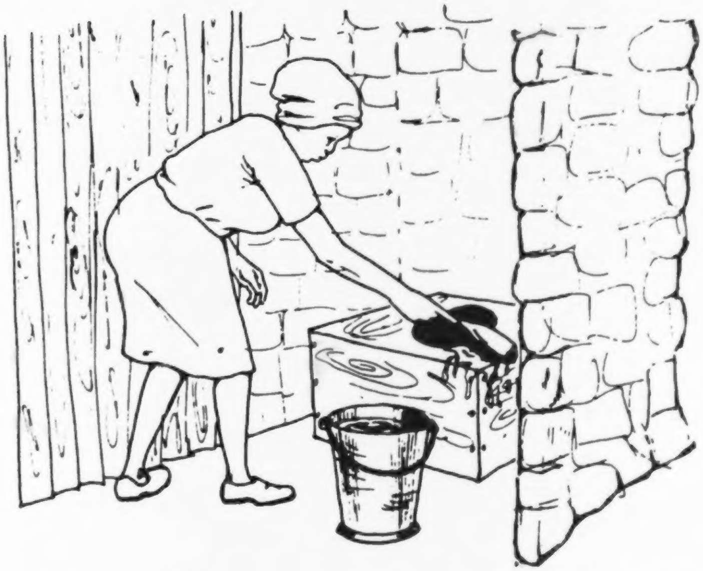
8. Fixing the Door

You can make a door that is fixed or hung from the top. You can use hide, plastic, sack, or other materials that are available. You can also make a door that is fixed from the side. You can use boards, thatch, thin branches and leaves, or other materials that are available. Remember not to let any light into the pit of the latrine. Always cover the hole when you are not using the latrine. This stops flies from entering and living in the latrine.


Ventilation
Corrugated roof
Removable cover
Floor
Soil dug from pit
Ground level
Pit
Sides of pit slant in

(From: MEDEX. "Clean Water and Clean Community". No. 32, pp. 28-31)

Taking Care of Your Latrine

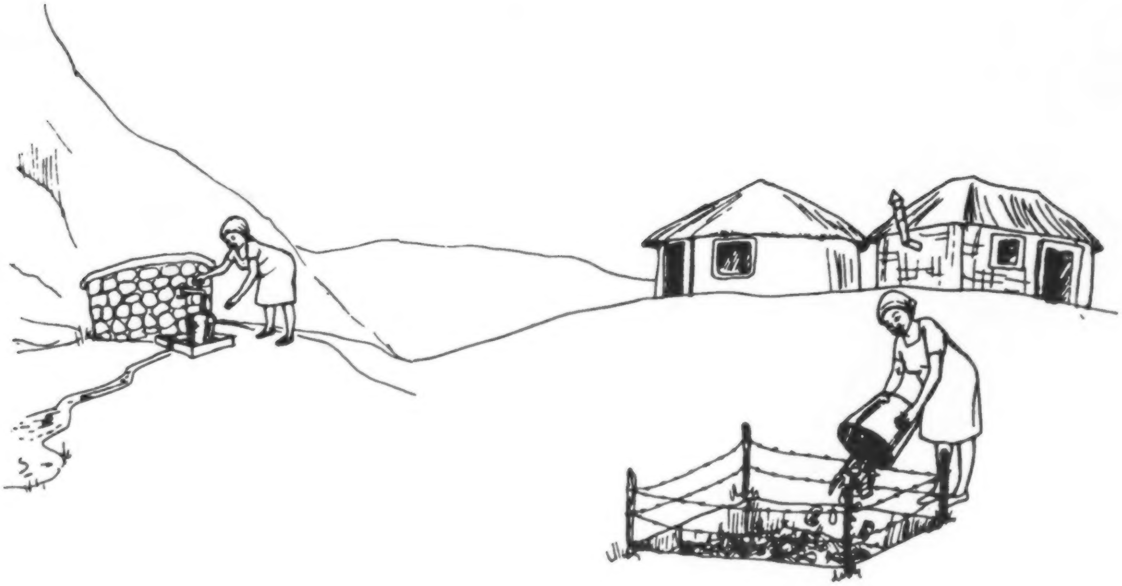


For your good health keep your latrine clean. Flies will not live and breed in a clean latrine. A clean latrine will also not smell. Here are some steps you can follow to keep your latrine clean.

1. Keep the seat, walls, and floor of your latrine clean. This stops flies from living in your latrine.
2. Cover the hole of your latrine when you are not using the latrine. Teach your whole family to do this.
3. Seal the pit carefully so there are no cracks. This stops light from entering the pit. Without light, flies cannot breed in the stool.
4. Make sure your latrine is not a nuisance to your neighbors.
5. Use the latrine until it is full to about one half meter from the top. Remove the walls, floor, and seat if possible. Cover the top of the pit with soil. Mark the area. Dig another pit and build another latrine. The pit can take about five years to fill if used by one family.
6. Twelve months after you cover the pit, you can dig up the pit and use the soil as fertilizer. Use the fertilizer on the vegetable garden or spread it on the fields just before plowing.

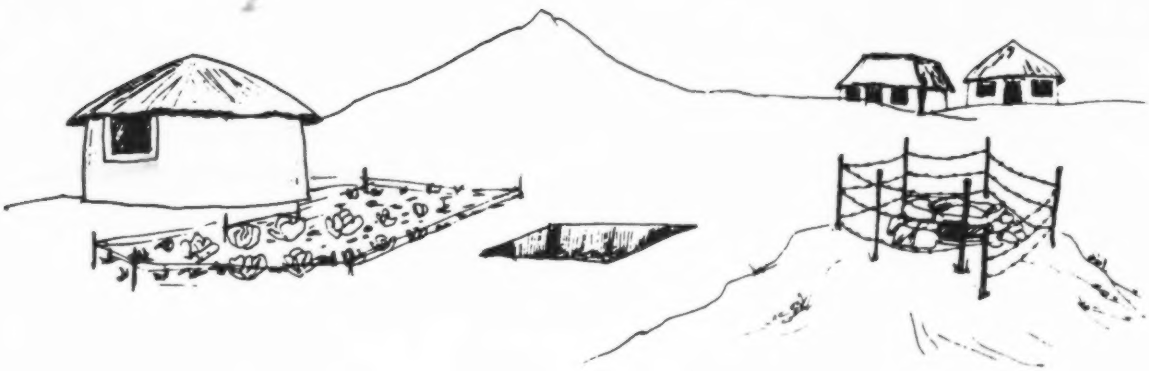
(From: MEDEX. "Clean Water and Clean Community." No. 32, pp. 32)

How to Make a Rubbish Pit



1. Locate the rubbish pit at least 10 meters from any water source. Dig the rubbish pit downhill from any water source.
2. Locate the rubbish pit at least 10 meters from your house.
3. Dig a hole 1 meter by 1 meter. Dig the hole about 1 meter deep. Slant the sides of the pit towards the center.
4. Throw rubbish into the pit. Cover the rubbish every day with soil to stop flies and other insects from living in the rubbish.
5. When the pit is full to about 200 mm from the top, cover the pit with soil. Dig another rubbish pit.

How to Make a Compost Pit



1. Locate the compost pit in or near the garden. The compost pit should be at least 10 meters from your house.
2. Locate the compost pit at least 5 meters from a water source. Locate the compost pit downhill from any water source.
3. Dig a hole 750 mm by 1.5 meters. Dig the hole about 1 meter deep.
4. Make a layer of dug soil of about 100 mm at the bottom of the pit.
5. Throw vegetable matter on top of the layer of soil. Vegetable matter can be grass, weeds, or waste from the kitchen. You can also throw cattle manure into the pit. When the vegetable matter is 250 mm deep, add another layer of 100 mm of soil.
6. Keep the compost pit moist. Do not soak the compost pit.
7. Turn the contents of the compost pit every two months in the summer. Turn the contents of the pit every three months in the winter.
8. Cover the pit with soil when it fills up. Mark the position of the compost pit.
9. You can use the contents of the compost pit as fertilizer after six months.

(From: MEDEX. "Clean Water and Clean Community." No. 32, p. 35)

GUIDELINES FOR SAFE FOOD

1. When you purchase, prepare and serve food, it is important to:

    - Select good quality food. Food should smell fresh, come from a clean source, be protected from flies and dirt and have a fresh attractive look and color.
    - Keep yourself clean.
    - Keep the cooking and eating area clean.

2. Food can become unsafe to eat if it is:
    - Served by a person carrying disease germs
    - Served in soiled dishes
    - Eaten with dirty utensils and hands.

3. Keep everything clean. Cleanliness helps to keep away disease germs. Clean food is likely to be safe food.

4. When preparing foods:

    - Store them for a very short time.
    - Prepare in clean containers.
    - Cook thoroughly.
    - Serve immediately.
    - Don't save leftovers unless you can put them in clean, covered containers in a cool place.

(From: A Training Manual in Appropriate Technology.
Attachment II-1-B p.9.)

ROLE PLAY INSTRUCTIONS

Setting: Front yard of a PC health worker's house. The PCV is building a fire under a large kettle of water which he or she is boiling to purify it for use in drinking and cooking. The PC health worker boils water on a weekly basis.

Walking along the road are two villagers who notice the PC health worker and stop to find out what he or she is doing.

Role Description and Instructions for Village Team

You represent two villagers who are walking along the road in front of the PC health worker's house as you've done many times. You are curious about the PCV in general and are particularly intrigued now because this is the third Sunday in a row that you have noticed him or her boiling a large kettle of water in front of the house. The PCV does not appear to use the boiled water to cook anything, rather, he or she puts the water into bottles which are taken into his or her house. In the village a combination of wood, dung and straw are used as fuel for cooking. Wood is costly and you cannot understand why the PCV uses so much wood for water boiling.

Select two people to represent the villagers. As a group, decide what questions the villagers should ask the PCV. Ask relevant questions regarding the wastage of wood and how the PCV knows the water is contaminated, etc.

"Time Out." During the course of the role play the two villagers as a unit may halt the action once to confer with the rest of your team regarding questions and comments to be posed to the health worker. Conferences are limited to 90 seconds.

Instructions for Observers

Your task is to observe the interaction between the PC health worker and the two villagers in this role play. Pay particular attention to how the PC health worker answers the villagers questions, what explanation s/he gives, and his or her general role in the interaction. Record your observations and be prepared to discuss them in the group discussion which will follow the role play.

Alternative Topics

The Volunteer is:

- screening windows to keep mosquitoes and flies out
- keeping small animals fenced in
- regularly sweeping the yard, cutting brush, and draining stagnant pools of water outside the home
- constructing/maintaining/using a latrine
- washing hands after toileting and before eating
- disposing of garbage in a sanitary manner (using a sanitary dump site, composting, etc.)

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